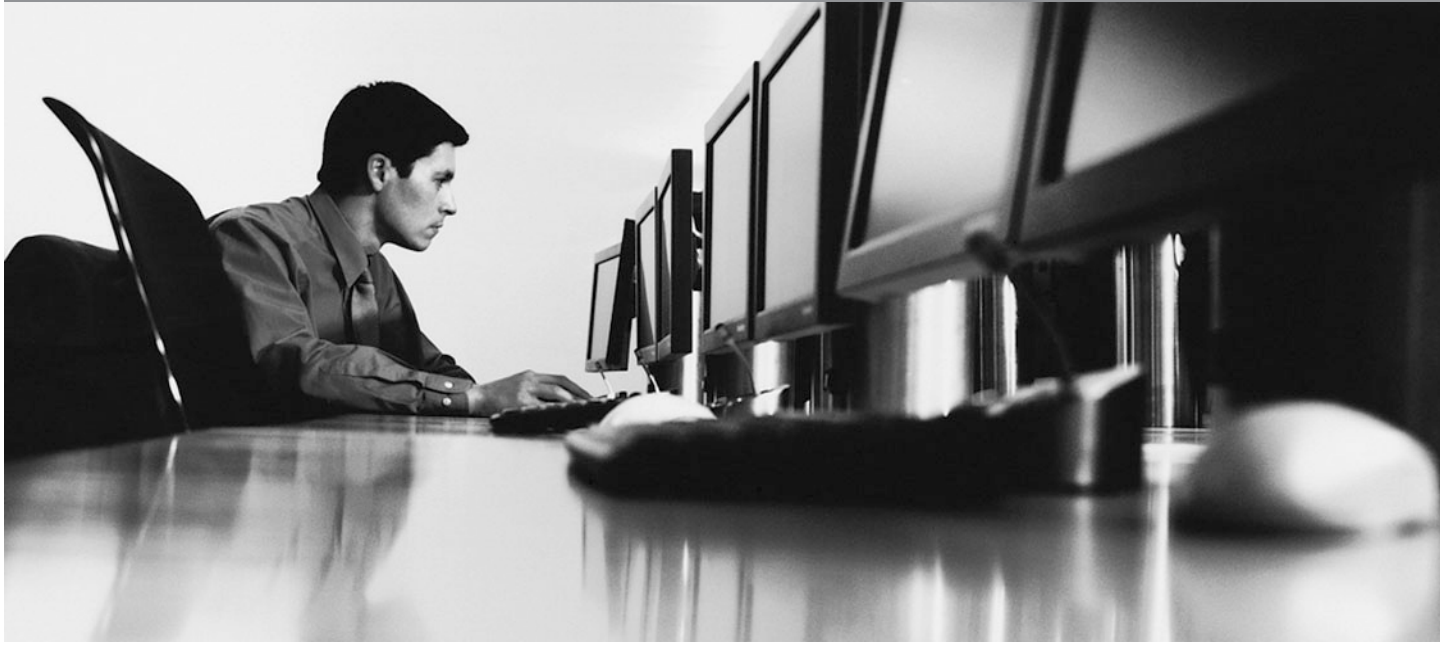
Avocent®

MERGEPOINT® SP MANAGER

Installer/User Guide



European Union Notification

WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

USA Notification

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Canadian Notification

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Japanese Notification

この装置は，クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI－A

Korean Notification

기종별	사용자 안내문
A급 기기 (업무용 정보통신기기)	이기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 구입 하였을 때에는 가정용으로 교환하시기 바랍니다.

MergePoint® SP Manager

Installer/User Guide

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Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Dangerous Voltage

This symbol is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Power On

This symbol indicates the principal on/off switch is in the on position.

Power Off

This symbol indicates the principal on/off switch is in the off position.

Protective Grounding Terminal

This symbol indicates a terminal which must be connected to earth ground prior to making any other connections to the equipment.

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CHAPTER 1

Product Overview

The MergePoint service processor (SP) manager is a secure, centralized enterprise management solution for target devices equipped with IPMI, HP®, Dell®, IBM®, Sun® and Fujitsu Technology Solutions (FTS) service processors (SPs). You can remotely perform server management tasks, including power control and console access, on managed target devices.

The MergePoint SP manager provides a standardized interface independent of the management protocols used to manage each SP. Management operations can be performed using the following three methods:

- The DSView® 3 management software interface.
- The MergePoint SP manager web interface from a standard web browser.
- Commands or scripts over a Telnet, command line interface (CLI) utility, Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), Secure Shell (SSH) session or Web Service for Management (WS-MAN).

  SMASH CLP is a standards-based user and scripting interface defined by the Distributed Management Task Force (DMTF). This interface provides a single command line interface to manage servers from multiple manufacturers, simplifying management and streamlining interoperability while providing scripting and automation capabilities.

NOTE: MergePoint SP manager refers to the SP5200/SP5300/SP5224/SP5324/SP5240/SP5340 models. For features supported only by specific models, the supported model is noted.

Features and Benefits

The MergePoint SP manager provides secure Serial over LAN (SoL) console access, power control and server hardware monitoring. With easy-to-use IPMI provisioning capabilities and an auto discovery mechanism for server management technologies within the network, the MergePoint manager is ideal for enterprise data centers as well as for high performance computing (HPC) and other clustering environments.

The MergePoint SP manager allows enterprise-class authentication, authorization and auditing (AAA) security and encryption, and extends this functionality to all servers. Other standard features include data logging, event detection and notification, SNMP proxy, graphing and alarm events for sensors and shared access to management ports. Also, simultaneous power control of multiple servers boosts the already existing power management capabilities of service processors, including graceful shutdown support for IPMI.

With multiple Ethernet ports, the MergePoint SP5x24/SP5x40 manager connects point-to-point with Ethernet-based service processors. By isolating and protecting the connected service processors from the external production network, the MergePoint SP5x24/SP5x40 manager provides secure and efficient rack-level management with seamless integration into the management infrastructure.

Supported SPs

A variety of service processors are supported by the MergePoint SP manager. For a complete list of SPs supported by the version of firmware on your appliance, see the release notes or visit www.avocent.com to check for the latest release notes and firmware update.

MergePoint SP5x00 Manager Configuration

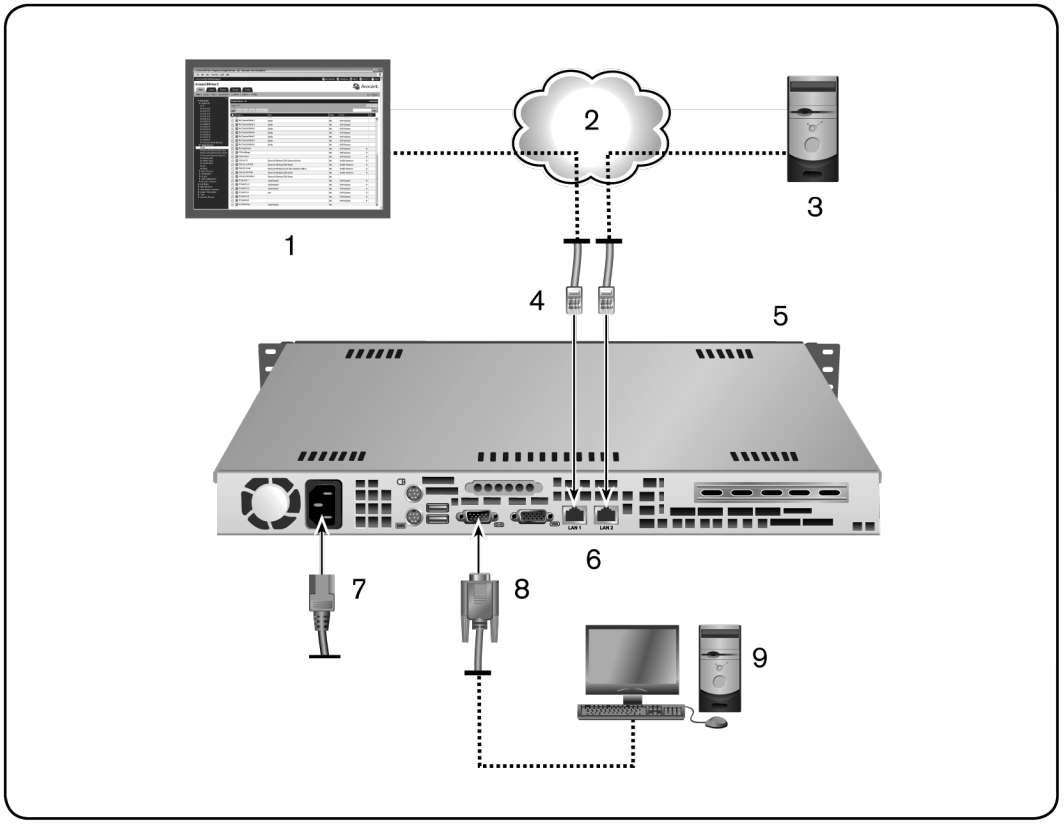

Figure 1.1: MergePoint SP5x00 Manager Configuration

Table 1.1: Descriptions for MergePoint 00 Manager Configuration

Number	Description	Number	Description
1	Remote User Web Interface	6	RJ-45 Ethernet Ports
2	LAN	7	Power
3	Target Device	8	Connection to the Serial Port

Number	Description	Number	Description
4	CAT 5 Cables	9	Terminal or Workstation (for Configuration)
5	MergePoint SP5x00 Manager		

LEDs on the MergePoint SP5x00 manager

On the front of the MergePoint SP5x00 manager, the LAN LED provides information about the LAN activity; the LED blinks to indicate activity. The power LED is green if the MergePoint SP5x00 manager is turned on.

MergePoint SP5x24/SP5x40 Manager Configuration

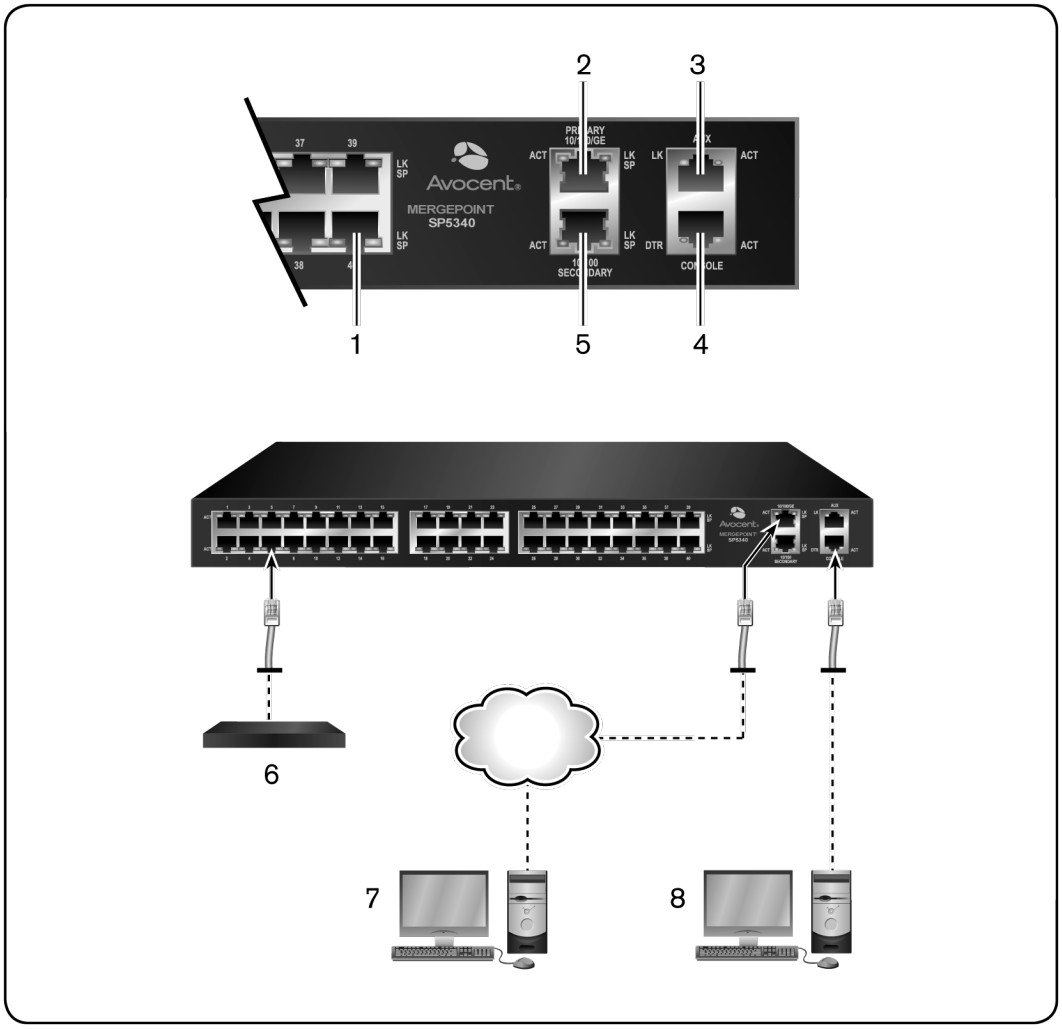

Figure 1.2: MergePoint SP5x24/SP5x40 Manager Configuration (SP5340 model shown)

Table 1.2: Descriptions for MergePoint 24/40 Manager Configuration

Number	Description	Number	Description
1	Private ethernet ports (24 or 40)	**5**	10/100 secondary public Ethernet port - (Optional) For connection to a second network connection or for failover connection to the primary network
2	10/100/GE (Gigabit Ethernet) primary public Ethernet port	**6**	Blade or service processor
3	Auxiliary (AUX) port (disabled)	**7**	Remote user web interface
4	Console port - For connecting either a terminal or a computer running a terminal emulation program	**8**	Console user

Safety Precautions

To avoid potentially fatal shock hazard and possible damage to equipment, please observe the following precautions:

- Do not use a 2-wire power cord in any Avocent product configuration.
- Test AC outlets at the target device and monitor for proper polarity and grounding.
- Use only with grounded outlets.

NOTE: The AC inlet is the main power disconnect.

Failure to observe the precautions in this section may result in personal injury or damage to equipment.

Observe the following general safety precautions when setting up and using Avocent equipment.

- Follow all cautions and instructions marked on the equipment.
- Follow all cautions and instructions in the installation documentation or on any cautionary cards shipped with the product.
- Do not push objects through the openings in the equipment. Dangerous voltages may be present. Objects with conductive properties can cause fire, electric shock or damage to the equipment.
- Do not make mechanical or electrical modifications to the equipment.
- Do not block or cover openings on the equipment.

- Choose a location that avoids excessive heat, direct sunlight, dust or chemical exposure, all of which can cause the product to fail. For example, do not place an Avocent product near a radiator or heat register, which can cause overheating.
- Connect products that have dual power supplies to two separate power sources, for example, one commercial circuit and one uninterruptible power supply (UPS). The power sources must be independent of each other and must be controlled by separate circuit breakers.
- For products that have AC power supplies, ensure that the voltage and frequency of the power source match the voltage and frequency on the label on the equipment.
- Products with AC power supplies have grounding-type three-wire power cords. Make sure the power cords are plugged into single-phase power systems that have a neutral ground.
- Do not use household extension power cords with Avocent equipment because household extension cords are not designed for use with computer systems and do not have overload protection.
- Make sure to connect DC power supplies to a grounded return.
- Ensure that air flow is sufficient to prevent extreme operating temperatures. Provide a minimum space of 6 inches (15 cm) in front and back for adequate airflow.
- Keep power and interface cables clear of foot traffic. Route cables inside walls, under the floor, through the ceiling or in protective channels or raceways.
- Route interface cables away from motors and other sources of magnetic or radio frequency interference.
- Stay within specified cable length limitations.
- Leave enough space in front and back of the equipment to allow access for servicing.

When installing Avocent equipment in a rack or cabinet, observe the following precautions:

- Ensure that the floor's surface is level.
- Load equipment starting at the bottom first and fill the rack or cabinet from the bottom to the top.
- Exercise caution to ensure that the rack or cabinet does not tip during installation and use an anti-tilt bar.

When using a desk or table, observe the following precautions:

- Choose a desk or table sturdy enough to hold the equipment.

- Place the equipment so that at least 50% of the equipment is inside the table or desk's leg support area to avoid tipping of the table or desk.

Rack mount safety considerations

- Elevated Ambient Temperature: If installed in a closed rack assembly, the operating temperature of the rack environment may be greater than room ambient. Use care not to exceed the rated maximum ambient temperature of the switch.
- Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings for maximum current.
- Reliable Earthing: Reliable earthing of rack mounted equipment should be maintained. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

Cabling installation, maintenance and safety tips

The following is a list of important safety considerations that should be reviewed prior to installing or maintaining your cables:

- Keep all CAT 5 runs to a maximum of 10 meters each.
- Maintain the twists of the pairs all the way to the point of termination, or no more than one half inch untwisted. Do not skin off more than one inch of jacket while terminating.
- If bending the cable is necessary, make it gradual with no bend sharper than a one inch radius. Allowing the cable to be sharply bent or kinked can permanently damage the cable's interior.
- Dress the cables neatly with cable ties, using low to moderate pressure. Do not overtighten ties.
- Cross-connect cables where necessary, using rated punch blocks, patch panels and components. Do not splice or bridge cable at any point.
- Keep CAT 5 cable as far away as possible from potential sources of EMI, such as electrical cables, transformers and light fixtures. Do not tie cables to electrical conduits or lay cables on electrical fixtures.

- Always test every installed segment with a cable tester. “Toning” alone is not an acceptable test.
- Always install jacks so as to prevent dust and other contaminants from settling on the contacts. The contacts of the jack should face up on the flush mounted plates, or left/right/down on surface mount boxes.
- Always leave extra slack on the cables, neatly coiled in the ceiling or nearest concealed location. Leave at least five feet at the work outlet side and 10 feet at the patch panel side.
- Choose either 568A or 568B wiring standard before beginning. Wire all jacks and patch panels for the same wiring scheme. Don’t mix 568A and 568B wiring in the same installation.
- Always obey all local and national fire and building codes. Be sure to firestop all cables that penetrate a firewall. Use plenum rated cable where it is required.

CAUTION: This MergePoint SP manager contains an internal battery that is used for the real time clock. This battery is not a field replaceable item, and replacement should not be attempted by a user. If real time clock errors occur and the battery is suspected, visit http://www.avocent.com/support or contact the Avocent Technical Support location nearest you.

WARNING: For Service Personnel Only - There is a risk of explosion if the battery is replaced with an incorrect type. Dispose of used batteries according to the manufacturer’s instructions.

CHAPTER 2

Installation and Setup

Configuring Power for the MergePoint SP manager

The MergePoint SP manager is supplied with single or dual AC or DC power supplies.

To configure AC power:

1. Make sure that the power switch on the MergePoint SP manager is turned off.
2. Plug the power cable into the MergePoint SP manager and into a power source.
3. Turn on the MergePoint SP manager.

To configure DC power:

DC power is connected to DC-powered MergePoint SP managers by way of three wires: Return (RTN), Ground (GND) and -48VDC.

WARNING: It is critical that the power source supports the DC power requirements of your appliance. Make sure that your power source is the correct type and that your DC power cables are in good condition before proceeding. Failure to do so could result in damage to the equipment or in personal injury.

The following diagram shows the connector configuration for connecting DC power. You may use either a flat-blade or Phillips screwdriver for this procedure.

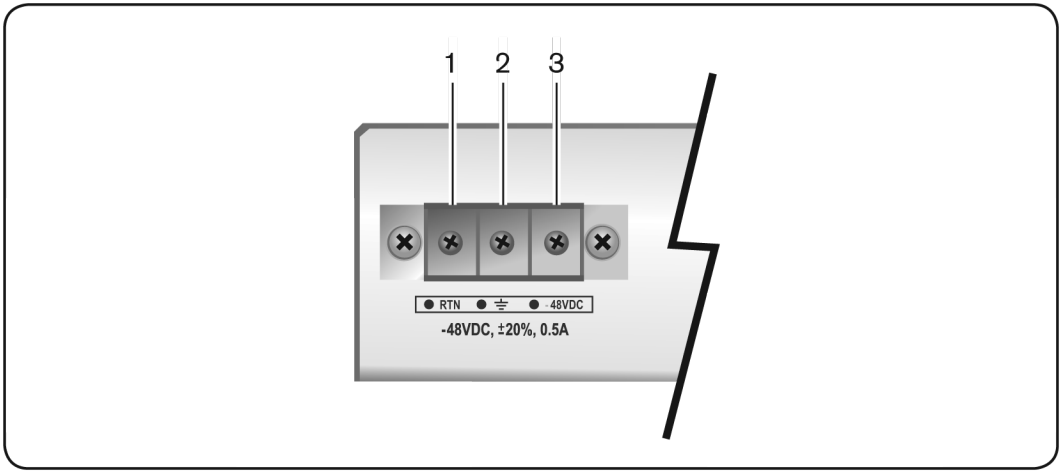

Figure 2.1: DC Power Connection Terminal Block

Table 2.1: DC Power Connection Details

Number	Description
1	RTN (Return)
2	GND (Ground)
3	-48VDC

1. Make sure that the power switch on the appliance is turned off.
2. Make sure that DC power cables are not connected to a power source.
3. Remove the protective cover from the DC power block by sliding it to the left or right.
4. Loosen all three DC power connection terminal screws.
5. Connect your return lead to the RTN terminal and tighten the screw.
6. Connect your ground lead to the GND terminal and tighten the screw.
7. Connect your -48VDC lead to the -48VDC terminal and tighten the screw.
8. Slide the protective cover back into place over the DC terminal block.

9. If your MergePoint SP manager has dual-input DC terminals, repeat steps 3 - 8 for the second terminal.
10. Connect the DC power cables to the DC power source and turn on the DC power source.
11. Turn on the MergePoint SP manager.

Connecting to the Network

To connect the MergePoint SP manager and service processors to the network:

1. Rack mount or place the MergePoint SP manager at the top of your server rack.
2. For a MergePoint SP5x00 manager: Using Ethernet cables, connect the LAN1 (eth0) network port on the back of the appliance to the external network, and connect the LAN2 (eth1) port to the internal network. In a typical installation, the LAN1 port provides access to the web interface, and the LAN2 port provides access to the service processors.

   -or-

   For a MergePoint SP5x24/SP5x40 manager: Connect an Ethernet cable from the primary Ethernet 10/100/GE (Gigabit Ethernet) port to the network. If desired, connect an Ethernet cable to the secondary Ethernet 10/100 port and configure the port for failover (see *Configuring MergePoint SP5x24/SP5x40 manager network settings* on page 22).

   Connect an Ethernet cable from any private Ethernet port on the MergePoint SP5x24/SP5x40 manager to dedicated Ethernet ports on a service processor or a dedicated Ethernet port on a blade chassis that manages multiple blades.
3. Turn on the power switches of the connected devices.

NOTE: Service processors should be configured according to their manufacturer's instructions.

Configuring the MergePoint SP Manager Basic Settings

The MergePoint SP manager is DHCP enabled by default. When you turn on the MergePoint SP manager for the first time, it attempts to obtain eth0 and eth1 IP addresses from the DHCP server. For installations where a DHCP server is not present or is unavailable, the following IP addresses are automatically assigned: 192.168.0.10 for eth0 and 192.168.0.20 for eth1.

To configure the MergePoint SP manager IP address through a serial connection:

1. Connect a terminal or a workstation that is running a terminal emulation program to the serial port.

2. Start a session with the port settings of serial speed as 9600 bps, data length as 8 data bits, parity as none, stop bits as 1, flow control as none and emulation as ANSI.

   Once a connection is established, a prompt appears.

3. Enter the username and password. The preset values is **admin** for both the username and password.

4. For the MergePoint SP5x00 manager:

   a. Type **2** (Network Config).

   b. Type a number from **1** to **5** to configure the corresponding network settings specific to your network. For example, type **1** to config eth0 IPv4; type **3** to config eth1 IPv4.

NOTE: If you wish to restore the default configuration parameters, enter **8** from the top-level menu.

-or-

For a MergePoint SP5x24/SP5x40 manager:

a. Log into the console port as **root** with the default password **Sydney**.

b. Enter the **passwd** command, and enter and confirm a new password for the root user.

c. Type **cli** to load the CLI utility.

d. Configure the primary Ethernet interface (eth0) by setting the method to static and assigning a static IP address, a gateway and a netmask:

```
cli> set network interface eth0 method static address
<SPmanager_IPaddress> gateway <gateway_IP_address> netmask
<netmask>
```

e. Specify a hostname, a domain, a DNS server IP address, and an optional secondary DNS server IP address:

```
cli> set network hostname <appliance_name> resolv domain
<domain_name> dns0 <DNS_server_IPaddress> dns1 <secondary_DNS_
server_IPaddress>
```

f. Confirm the configuration for the interface:

```
cli> get network interface eth0
```

g. Confirm the name server configuration:

```
cli> get network resolv
```

h. Save the changes:

```
cli> commit
```

i. Exit from the CLI utility:

```
cli> quit
```

NOTE: To restore default configuration parameters, type **restorefactory.**

NOTE: For more information on configuring IP address, see *Summary of How to Configure the Top Level Parameters* on page 136.

Activating the MergePoint SP5x00 Manager License

You must register your MergePoint SP5x00 manager online at www.avocent.com to obtain a master license key. Use the master key to activate the MergePoint SP5x00 manager before discovering SPs.

NOTE: Registration is not required for the MergePoint SP5x24/SP5x40 manager.

To activate the MergePoint SP5x00 manager license:

1. Follow the instructions on the registration card included with the MergePoint SP5x00 manager to activate the appliance serial number. Once completed, you will receive a master license key.
2. Open a web browser and enter the IP address (**http://<appliance IP address>**) of the appliance.
3. The MergePoint SP5x00 manager web interface window appears. Type the master key in the fields provided and click *Add*.
4. The User Login window appears. Type **admin** as the username and password. To change the admin password, see *Managing MergePoint SP Manager User Accounts* on page 29.

To add a master key:

1. Click the *System* tab.
2. In the top navigation bar, click *Licenses*. The License window appears.
3. Click *Add Master Key* and enter the key.
4. Click *Apply*.

To view license information (Admin users only):

1. Click *System – Licenses* for a license summary and list of license keys and descriptions.

NOTE: Licenses are also required for each SP you wish to manage; see *Service Processor Licenses* on page 33.

Adding the MergePoint SP Manager to a DSView 3 Software Installation

If you will be using the MergePoint SP manager within a DSView 3 software installation, you may now use the DSView 3 software Add Appliance wizard to add the MergePoint SP manager and finish configuration. For detailed instructions, refer to the DSView 3 software installer/user guide.

MergePoint SP Manager Configuration Wizard

Use the configuration wizard to quickly set up a new MergePoint SP manager. The wizard window opens automatically the first time you log in to the appliance, or after you reset a MergePoint SP5x00 manager through the serial port and log in again; see *Restarting the MergePoint SP5x00 manager* on page 197. You can also open the wizard by selecting *System - Wizard*.

The wizard allows you to configure appliance settings such as alias, default user account, discovery range, appliance network, provisioning, SNMP, host table and so on. These settings can be saved as an XML file for future use when you configure an appliance using the wizard.

To configure a MergePoint SP manager using the wizard (Admin users only):

1. Click the *System* tab.
2. In the top navigation bar, click *Wizard*.
3. (MergePoint SP5x00 manager only) In the Add-On License Key panel, enter the new slave key, then click *Next*. For more information, see *Service Processor Licenses* on page 33.
4. Click *Load Config File* if you wish to import a previously saved configuration file (see *Saving the wizard settings in a config file* on page 17).

   -or-

   Click *Next* to enter the Wizard Parameters Settings page.
5. In the Appliance Alias field, type the new name for the appliance.
6. Configure the settings displayed and follow the on-screen instructions. For more information about how to configure settings, see the corresponding reference in *MergePoint SP Manager Configuration Wizard* on page 16.
7. Click *OK* to reboot the appliance. The configuration takes effect after the reboot is complete.

Table 2.2: References for Configuration Settings

Setting or Panel	Reference
Default User Accounts	*Managing Default Users (Admin users only)* on page 43
Authentication	*Configuring External Authentication Services* on page 95
Alert Action	*Using the Alerts Viewer* on page 58
User Roles	*Managing MergePoint SP Manager User Accounts* on page 29
Appliance Network	*Configuring the MergePoint SP Manager Network Settings* on page 19
SNMP	*SNMP Access* on page 63
Host Table	*Host table* on page 72
Static Routes	*Static routes* on page 73
Set Discovery Range	*Discovering and Adding SPs (Admin Users Only)* on page 34
Provisioning	*BMC Provisioning (IPMI Targets Only)* on page 26

Saving the wizard settings in a config file

Once you have completed the configuration wizard, you can save the settings for future use. Some settings, such as appliance alias, are specific to each MergePoint SP manager. These appliance-specific settings can be modified before applying the configuration.

To save a config file:

1. Complete the steps in *MergePoint SP Manager Configuration Wizard* on page 16.
2. Click *Save Config File to Disk*. All wizard data is compiled and a download link appears below the Save Config File to Disk button.
3. Right-click *Download* and select *Save Target As* to save the data file, or click *Download* to view the data file.

Modifying the config file settings (Admin users only)

You can modify the config file from the wizard interface or from an XML editor. Modifying a config file using an XML editor is only recommended for advanced users who are familiar with XML.

To modify a config file from the wizard interface:

1. Click the *System - Wizard*.

2. Click *Load Config File.*
3. In the Filename field, type the path to the file you wish to open or click *Browse* to locate the file.
4. Click *Upload* to import the data in the file to the wizard. The settings stored in the config appear on screen. Optionally, use this interface to modify any settings that need to be changed for this appliance.
5. Click *Apply Current Config* to configure the appliance.

To manually modify the config file using an XML editor:

CAUTION: The following procedure is recommended for advanced users only; if you inadvertently corrupt the XML code, the config file may become unusable or cause error messages when loaded in the wizard.

1. Download and save a config file. For more information, see *Saving the wizard settings in a config file* on page 17.
2. Open the config file with an XML editor.
3. Modify the property values as you desire. See *Modifying the config file settings (Admin users only)* on page 17 for more information.
4. Validate the config file with an XML-compliant browser or an XML validation tool.
5. Save the config file.

Table 2.3: Samples of the Config File for the MergePoint 24/40 Manager

Sample code from config file	Description
..... - <optionlist **optionlistId="network_ device_name"**> <option value="eth0" /> <option value="eth1" /> <option value="bond0" /> <option value="br0" /> </optionlist> ..... <elements elementsId="MP_Network_Device"> - <element elementId="Network_Device_ Eth0"> <property propertyId="Interface_Name" **classification="SingleSelect" optionlistId="network_device_name"** value="eth0" /> ..... </element> .... </elements>	• <optionlist> defines a value scope in a <property>. • In the example <optionlist> "network_device_ name" determines the value of **optionlistId** "network_device_name" in the <property> "Interface_Name. • classification= "SingleSelect" means the value of this property can only be the <option> value in the corresponding <optionlist>. **NOTE:** You are not allowed to add, delete or modify any of the <optionlist> parameters.
- <elements elementsId="MP_User"> - <element> <property propertyId="Name" **unique="true"** classification="String" size="64" value="admin" /> - <!-- The value of Password can't be edited. --> <property **propertyId="Password"** classification="String" size="64" **value="1FMKp84sM$K.L1haftQaeznWLB7T/6S."** /> .... </element> ..... </elements>	• The password of an MP_User is encrypted and cannot be changed. • Each MergePoint SP manager should have at least one Admin user. An Admin user account cannot be deleted if it is the only Admin user account configured. • unique="true" means the value of this property cannot be duplicated.

Configuring the MergePoint SP Manager Network Settings

Ethernet ports on the MergePoint SP5x00 manager

The MergePoint SP5x00 manager has two public Ethernet ports (eth0 and eth1), which are labeled LAN1 and LAN2. The eth0 port is for connecting to the external network and eth1 is for connecting to service processors on the internal network.

NOTE: Connecting service processors to eth0 is not recommended because some services, like BMC provisioning or DHCP servers, only listen to eth1.

Ethernet ports on the MergePoint SP5x24/SP5x40 manager

The MergePoint SP5x24/SP5x40 manager has two public Ethernet ports (eth0 and eth1) and 24 or 40 Ethernet private ports. The public ports are used for connecting to the public (or management) network and the private ports are used for connecting to service processors on the private network. Therefore, the managed private side of the MergePoint SP manager is isolated from the public side to ensure security. Access to all connected service processor servers is consolidated through the one publicly known IP address.

Private Ethernet ports

The MergePoint SP5x24/SP5x40 manager is aware of only a single interface to the private network, priv0, for communicating with the SPs. Packets are sent and received by priv0 through the private Ethernet ports.

Each private Ethernet port may be connected to one or to multiple service processors. For example, an Ethernet port may be connected to a blade manager with multiple service processors, and in those cases a single private Ethernet port may require multiple IP addresses.

All communication among private Ethernet ports is blocked unless priv0 is the sending or receiving port.

Public Ethernet ports

On the public side of the MergePoint SP5x24/SP5x40 manager, the primary and secondary Ethernet ports are referred to as eth0 and eth1.

Failover

Failover is important for high-availability environments where constant accessibility is required to support mission-critical applications. The secondary Ethernet port on the MergePoint SP5x24/SP5x40 manager can optionally be configured for failover. Failover automatically redirects traffic from the primary Ethernet port to the secondary Ethernet port should the primary interface fail.

The primary Ethernet port continues to be monitored, and when it starts functioning again, traffic is then automatically redirected back through the primary Ethernet port. All connection sessions continue without interruption.

With failover, both the primary and secondary Ethernet ports are assigned a single IP and single MAC [Ethernet] address. After failover is enabled, the bonded Ethernet interfaces are referred to as bond0.

Bridge mode

Bridge mode bridges the private Ethernet ports with the public Ethernet ports, allowing traffic to go through the MergePoint SP5x24/SP5x40 manager from a host on the external network to a service processor on the internal network and vice-versa, with no interference from the MergePoint SP manager itself.

After Bridge mode is enabled, the bridged Ethernet interfaces are referred to as br0; the eth0, eth1 and priv0 are not accessible at the same time.

NOTE: If Bridge mode is enabled, security settings are no longer managed by the MergePoint SP manager. Instead, the user must configure any required security settings from the service processor attached to the MergePoint SP manager.

Configuring MergePoint SP5x00 manager network settings

In the Appliance Network Setting window, you can set IP addresses for the Ethernet ports and configure a DNS server.

A primary and a secondary DNS server may be configured to allow the use of SP names instead of IP addresses.

You can also set VLAN for each Ethernet interface.

To configure network settings for the MergePoint SP5x00 manager (Admin users only):

1. Click the *Network* tab.
2. In the top navigation bar, click *Network*.
3. Select *Eth0* or *Eth1* as the default gateway and click *Apply*.
4. Configure the following fields for the Domain Name System (DNS) server:
   a. In the Primary server field, type the IP address of the primary server.
   b. In the Secondary server field, type the IP address of the secondary server.
   c. In the Domain name field, type the domain name.
   d. Click *Apply*.
5. Click a device link. Configure IPv4 and/or IPv6 addresses by entering the following information in the respective areas.
   a. In the MTU field, accept or change the existing value.
   b. For the DHCP method, select *DHCP*.

      -or-

For the Static method, select *Static* and enter the address, subnet mask, gateway in the fields provided. For IPv4 only, also enter the broadcast in the field provided.

c. Click *Apply*.

To enable VLAN for the MergePoint SP5x00 manager (Admin users only):

1. Click the *Network* tab.
2. Click a device link. Configure VLAN for the device:
   a. In the ID field, type the ID for the VLAN.
   b. In the Status drop-down menu, select *Yes* to enable VLAN.
   c. Click *Apply*.

Configuring MergePoint SP5x24/SP5x40 manager network settings

When configuring Ethernet ports, be aware of the following conditions:

- In Normal mode, eth0 and eth1 are separate network interface cards and all standard networking rules apply. When each Ethernet port is active and assigned a different IP address, both ports are reachable through either IP address even if the cable is disconnected from one of the interfaces.
- In Failover mode, the secondary Ethernet interface becomes bonded to the primary Ethernet interface and both are referred to as a single bond0 interface. The bond0 IP address is used for both eth0 and eth1 physical network interface cards. As a result, the same set of values applies to the single bond0 interface.
- In Bridge mode, both the primary and secondary Ethernet interface become disabled. The Br0 IP address is used as the host address for the MergePoint SP manager and is accessible from any of the physical ports, including the private ports. In addition, security settings are no longer managed by the MergePoint SP manager. Instead, the user must configure any required security settings from the service processor attached to the MergePoint SP manager.

To configure network settings for the MergePoint SP5x24/SP5x40 manager (Admin users only):

1. Click the Network tab.
2. In the top navigation bar, click *Network*. The Appliance Network Setting window appears.
3. In the mode drop-down menu, select the mode and click *Apply*.
4. Select *eth0* or *eth1* as the default gateway and click *Apply*.

5. Configure the following fields for the Domain Name System (DNS) server:
   a. In the Primary server field, type the IP address of the primary server.
   b. In the Secondary server field, type the IP address of the secondary server.
   c. In the Domain name field, type the domain name.
   d. Click *Apply*.
6. Click a device link. Configure IPv4 and/or IPv6 addresses by entering the following information in the respective areas.
   a. In the MTU field, accept or change the existing value.
   b. For the DHCP method, select *DHCP*.

      -or-

      For the Static method, select *Static* and enter the address, subnet mask, gateway in the fields provided. For IPv4 only, also enter the broadcast in the field provided.
   c. Click *Apply*.

NOTE: For Normal mode, you may configure either eth0 or eth1, or both. For Failover mode, you only need to configure Ethernet port bond0. For Bridge mode, you only need to configure Ethernet port br0.

NOTE: Network settings may also be changed using the CLI utility. See related CLI commands in *Summary of How to Configure the Top Level Parameters* on page 136.

You may set a switch port speed individually, or retrieve the current port speed from the MergePoint SP5x24/SP5x40 manager.

To set the switch port speed:

1. Log into the MergePoint SP manager console as **root**.
2. Set the port speed using the following command:

```
sysctl marvell.xxx=value
(Value=auto/10f/10h/100f/100h/10F/10H/100F/100H)
```

NOTE: The definitions for the values are: - auto: Auto mode. The system selects an appropriate speed for the switch port. - 10f / 10h / 100f / 100h: Mandatory mode. The system cannot change the value. This setting may cause operations to fail if the value is not appropriate for the switch port. - 10F / 10H / 100F / 100H: Negotiable mode. The system may use this value, or set another value if this value is not appropriate for the switch port.

To get the individual port speed:

1. Log into the MergePoint SP manager console as **root**.
2. Retrieve the current speech of the switch port using the following command:

```
sysctl –n marvell.xxx
```

NOTE: The xxx value is the switch port number. The output is the current speed of the switch port. The current speed may differ from the speed you set if you chose auto mode or negotiable mode for the speed value.

Private Subnets on the MergePoint SP5x24/SP5x40 Manager

Service processors connecting to the private subnets on a MergePoint SP5x24/SP5x40 manager can be isolated on a management network that is separate from the production and public networks. To enable communications between the SPs and the MergePoint SP5x24/SP5x40 manager, an Admin user must configure at least one private subnet. The Admin user then assigns each private subnet the following:

- A name
- An address within the private subnet's address range to be used by the SP when communicating with the MergePoint SP manager

Any number of private subnets may be configured. Multiple private subnets may be needed if IP addresses for SPs are not in the same range.

NOTE: If changing or deleting a private subnet, reassign all affected devices to another private subnet to avoid making them unavailable.

NOTE: If you are using DHCP and plan to assign a 192.168.0.x address to the MergePoint SP manager, see *Setting up a private subnet and DHCP service in the 192.168.0.x range* on page 198 to avoid IP address conflicts.

To add a private subnet:

1. Click *Network - Private subnet*.
2. Click *Add*.
3. Enter a name in the Private subnet name field.
4. In the Appliance side IP address field, enter an IP address for the MergePoint SP5x24/SP5x40 manager within the private subnet's network address range.
5. In the Subnet Mask field, enter a netmask for the private subnet.
6. Click *Apply*.

To edit a private subnet:

1. Click *Network - Private subnet*.
2. Click the name link of the private subnet you want to edit.
3. Modify the fields as needed.
4. Click *Apply*.

To delete a private subnet:

1. Click *Network - Private subnet*.
2. Check the private subnet you want to delete and click *Delete*.

Firewall/Packet Filtering

Packet filtering on the MergePoint SP manager is controlled by chains and rules that are configured in iptables. By default, the MergePoint SP manager does not forward any traffic between private and public networks. Rules can be added to allow limited communications between specific SPs on the private network and the public network.

NOTE: It is possible for an Admin user to create rules that circumvent the access controls on an SP.

Chains

A chain is a type of named profile that defines rules for sorting packets.

The MergePoint SP manager has a number of built-in chains with hidden rules that are preconfigured to control communications between SPs connected to the private Ethernet ports and devices on the public side of the MergePoint SP manager.

The default chains are defined in filter and NAT (network address translation) iptables. The mangle table is not used. The built-in chains are named according to the type of packets they handle. The first three chains, INPUT, OUTPUT and FORWARD are in the iptables filter table.

PREROUTING, POSTROUTING and OUTPUT are in the NAT table and implement NAT. This includes redirecting packets addressed to a virtual IP to the SP's real IP address and then hiding the SP's real IP address when the SP sends packets to a user.

Rules

Each chain can have one or more rules that define the following:

- The packet characteristics being filtered. The packet is checked for characteristics defined in the rule, for example, a specific IP header, input and output interfaces and protocol.
- What action is performed when the packet characteristics match the rule. The packet is handled according to the specified action (called a Rule Target, Target Action or Policy).

Rules are listed in order of priority. You can change the rule order by clicking the arrow on the rule line. The arrow appears when there are at least two rules in a list.

When a packet is filtered, its characteristics are compared against each rule in the list until a match is found. Once a match is found, the packet is processed and no attempt is made to match lower priority rules.

To add a new packet filtering (firewall) rule:

1. Click *Network - Firewall*.
2. Click *Add* for the chain to which you wish to add a rule.
3. Configure one or more of the following filtering options, as desired.
   a. In the Protocol drop-down menu, select a protocol.
   b. In the Source IP/mask field, type a source IP and subnet mask in the form: hostIPaddress or networkIPaddress/NN.
   c. In the Destination IP/mask field, type a destination IP and subnet mask in the form: hostIPaddress or networkIPaddress/NN.
   d. In the Input interface or Output interface drop-down menu, select an input or output interface depending on which chain you select.
   e. In the Fragments drop-down menu, choose the type of packets to be filtered.
   f. In the Rule target drop-down menu, select a target.
4. Click *Apply*.

To edit a packet filtering (firewall) rule:

1. Click *Network - Firewall*.
2. Select the rule you want to change.
3. Modify the fields as needed.
4. Click *Apply*.

To delete a packet filtering (firewall) rule:

1. Click *Network - Firewall*.
2. Select the rule you want to delete and click the corresponding *Delete* button.

NOTE: Rules may also be changed using the CLI utility. See related CLI commands in *Summary of How to Configure the Top Level Parameters* on page 136.

BMC Provisioning (IPMI Targets Only)

NOTE: Before setting up BMC provisioning, create a private subnet. See *Private Subnets on the MergePoint SP5x24/SP5x40 Manager* on page 24.

The default status of the BMC on an SP is disabled and should be provisioned before it can be discovered by the MergePoint SP manager.

The MergePoint SP manager provides a PXE (Preboot Execution Environment) based solution for provisioning the BMC and can be configured to automatically provision the IPMI BMC of a target device. The network interface card (NIC) on the BMC must support PXE to the NIC interface. If you have a dedicated IPMI NIC, your system may not support PXE to that device or port.

There are two modes of provisioning available: dynamic and static. For static provisioning, when the SP manager receives a PXE request from an SP, it can obtain its MAC address from the request and use it for comparison with the MAC address and IP address pairs in the static provisioning table. If a MAC address in the table meets this request, the MergePoint SP manager will assign the corresponding IP address to the SP.

Dynamic provisioning occurs when no match is found and the MergePoint SP manager selects an IP address from a specified range for the SP.

Once you have provisioned the BMC successfully, the SP is automatically initialized with the specified provisioning parameters and added to the Managed SP list and side navigation bar where it can then be accessed with the MergePoint SP manager. The number of in use and free license is re-calculated.

NOTE: Automatic provisioning is an optional feature that is only available for target devices that have IPMI BMCs.

Starting or stopping the BMC provisioning service (Admin users only)

You may start or stop the BMC provisioning service through the Provisioning window. If the *Stop* button is clicked, the BMC provisioning service stops and the MergePoint SP manager will no longer accept PXE boot requests from SPs on the LAN. However, previously provisioned SPs that have IPMI BMCs can still be discovered.

To stop or start the BMC provisioning service:

1. Click *SP - Provisioning*.
2. In the Provisioning window, click *Stop* or *Start* as appropriate.

Configuring PXE parameters for IPMI BMC provisioning (Admin users only)

You must configure provisioning parameters for a BMC that will be initialized and managed by the MergePoint SP manager.

To set basic provisioning parameters in the MergePoint SP5x00 manager:

1. Click *SP - Provisioning*.
2. Enter the username and gateway address in the fields provided.
3. In both the Password and Confirm Password fields, enter the password.

4. Check the VLAN Enable field if you need to use VLAN on BMC, and specify the following VLAN parameters:
   a. In the VLAN ID field, type the VLAN ID.
   b. In the VLAN Priority field, type the VLAN priority.
5. Click *Apply*.

NOTE: For the MergePoint SP5x00 manager, it is strongly recommended that the VLAN ID on the BMC and the MergePoint SP5x00 manager are the same; otherwise, the BMC cannot communicate with the MergePoint SP manager in the VLAN mode.

To set basic provisioning parameters in the MergePoint SP5x24/SP5x40 manager:

1. Click *SP - Provisioning*.
2. In the Subnet drop-down menu, select a subnet.
3. Enter the username and gateway address in the fields provided.
4. In both the Password and Confirm Password field, enter the password.
5. Select *VLAN Enable* to use VLAN on the BMC, and specify the following parameters:
   a. In the VLAN ID field, type the VLAN ID.
   b. In the VLAN Priority field, type the VLAN priority.
6. Click *Apply*.

To set dynamic provisioning parameters:

1. Click *SP - Provisioning*.
2. In the Dynamic Provisioning area, enter the Start and End IP addresses of a range of optional BMC IP addresses.
3. Click *Apply*.

To set static provisioning parameters:

1. Click *SP - Provisioning*.
2. In the Static Provisioning area, click *Add* and specify the requested PXE parameters.
3. Click *Apply*.

NOTE: To modify the static IP address, click the name link and follow the on-screen instructions. To delete a static IP address, select the name link and click *Delete*.

BMC log

Once BMC provisioning starts, an activity log is displayed in the Provisioning window listing all IP addresses which have been assigned to SPs. A status of Confirmed or Unconfirmed is displayed for each SP in the specified IP address range. A status of Confirmed in the State column indicates that the BMC provisioning for that SP is complete and the SP can now be managed by the MergePoint SP manager.

To delete the provisioning log (Admin users only):

1. Click *SP- Provisioning*.
2. In the Provisioning Log area, select the desired line(s) and click *Delete*.

Managing MergePoint SP Manager User Accounts

The default user account username and password are both **admin**. Each MergePoint SP manager should have at least one Admin user. An Admin user account cannot be deleted if it is the only Admin user account configured.

You may specify a role of Admin, Operator, User or a customized role for each user and/or group account. Each role is associated with specific privileges. The Admin role allows the user to modify all settings, perform all appliance operations and manage all SPs. The Operator role allows the user to perform basic operations, modify a limited number of settings and manage assigned SPs. The User role allows the user to view and query information of assigned SPs but prevents the user from performing most operations and modifying most settings. Customized roles are created under the Group Role tab. An Admin can specify privileges for the customized roles and assign users and groups to customized roles.

User accounts can also be managed in groups. A user is allowed to manage both SPs assigned to his or her user account and SPs assigned to any group to which the user belongs. The role assigned to the user account takes precedence of the roles assigned to groups to which the user belongs.

Additionally, if you are using an external authentication server to manage MergePoint SP manager users, you can use roles to manage permissions for external users. First, create a group on the external authentication server that has the same name as a group on the MergePoint SP manager. Next, assign a role to the MergePoint SP manager group. Now when externally authenticated users who are members of the group log in to the MergePoint SP manager, their privileges are determined by the role assigned to the group.

Reserved words (do not use as usernames)

Reserved words are predefined words that have special meaning to the MergePoint SP manager. Do not use the following reserved words when configuring usernames.

Table 2.4: Reserved Word

adm	daemon	gnats	news	src	utmp
admin	dialout	ip	nobody	sshd	video
apache	disk	irc	operator	sudo	voice
audio	dip	kmem	postgres	sync	wheel
backup	fax	lisy	proxy	tape	wwwdata
bin	floppy	mail	root	tty	
cdrom	games	man	shadow	uucp	

To add an appliance user (Admin users only):

1. Click *Users - User Roles*.
2. Click *Add*.
3. Specify the following information for the new user:
   a. In the User Name field, type the username.
   b. In the Password field, type the password.
   c. From the Role menu, select the role you wish to assign to the user: *Admin*, *Operator*, *User* or a customized role.
   d. For Operator, User or customized role privilege users, select the SPs which can be managed by the user. For Admin privilege users, skip this step (by default, Admin users are permitted to access all devices).
4. Click *Apply*.

To edit an appliance user (Admin users only):

1. Click *Users - Users*.
2. Click the username link for the user you wish to edit.
3. To change the password, select *Change Password*. Type the new password in the New Password and Confirm Password fields.

4. To change the privileges assigned to the user, select the desired privilege from the Privilege drop-down menu: Admin, Operator, User or customized roles.
5. For Operator, User or customized role privilege users, select the SPs which can be managed by the user. For Admin privilege users, skip this step.
6. Click *Apply*.

To delete an appliance user (Admin users only):

1. Click *Users - Users*.
2. Click the username link for the user you wish to delete and click *Delete*.

To customize a new role (Admin users only):

1. Click *Users - Roles*.
2. Click *Add*.
3. In the Role Name field, type the name of the user role you want to create.
4. Check the operation(s) which you want this user role to access.
5. Click *Apply*.

To change the password for the user account (for Operator and User users only):

1. Click *Users - Users*.
2. Type the new password in the New Password and Confirm Password fields and click *Apply*.

To create a new user group (Admin users only):

1. Click *Users - Groups*.
2. Click *Add*.
    a. Specify the following information for the new user:
    b. In the User Group Name field, type the group name.
    c. From the Role menu, select the role you wish to assign to the user: *Admin*, *Operator*, *User* or a customize roles.

NOTE: If the user group is for users managed by an external authentication server, ensure that a role of the same name exists on the authentication server.

    d. In the Users area, select the users for the group.
    e. In the SP area, select the SPs for the group.
3. Click *Apply*.

To edit a user group (Admin users only):

1. Click *Users - Groups*.
2. Click the link of the group name you want to edit.
3. Edit the settings as needed and click *Apply*.

To delete a user group (Admin users only):

1. Click *Users - Groups*.
2. Select the user group you want to delete and click *Delete*.

DHCP on the MergePoint SP Manager

The MergePoint SP manager has a Dynamic Host Configuration Protocol (DHCP) server to quickly and efficiently configure new devices on the Ethernet. It supports Dynamic and Static DHCP; static DHCP is performed before dynamic DHCP.

DHCP-assigned SPs can be added to a managed SP list automatically if the username and password of the device match the default username and password.

DHCP on the MergePoint SP manager supports DHCP relay. The DHCP relay is a Bootstrap Protocol (BOOTP) relay agent that sends DHCP messages between DHCP clients and DHCP servers on different IP networks. After enabling DHCP relay, you must configure a DHCP relay server in another physical network.

Once DHCP starts, an activity log is displayed in the DHCP window listing all IP addresses which have been assigned to SPs.

To set the DHCP parameters in the MergePoint SP5x00 manager:

1. Click *SP - DHCP*.
2. For dynamic DHCP, specify the Start and End IP range of addresses in the dynamic DHCP area.
   -or-
   For static DHCP, click *Add* in the Static IP area and specify the requested parameters.
3. Click *Apply*.

To set the DHCP parameters in the MergePoint SP5x24/SP5x40 manager:

1. Click *SP - DHCP*.
2. In the Subnet drop-down menu, select a subnet.

3. For dynamic DHCP, specify the Start and End IP range of addresses in the dynamic DHCP area.

   -or-

   For static DHCP, click *Add* in the Static IP area and specify the requested parameters.

4. Click *Apply*.

NOTE: To modify a static IP address, click on the name of the IP address and follow the on-screen instructions. To delete a static IP address, select the check box next to the name and click *Delete*.

To stop or start the DHCP service:

1. Click *SP - DHCP*.
2. Click *Stop* or *Start* as appropriate.

To configure the DHCP relay server:

1. Click *SP - DHCP*.
2. In the Status area, select *Enable* to activate DHCP relay.
3. In the Server field, enter the IP address or the name of the DHCP relay server.
4. Click *Apply*.

NOTE: DHCP settings may also be changed using the CLI utility. See the related CLI commands in *Summary of How to Configure the Top Level Parameters* on page 136.

Service Processor Licenses

A license is required for each SP managed by the MergePoint SP manager. Blade chassis require a license for the chassis itself and for each blade housed in the chassis.

The MergePoint SP5x24/SP5x40 manager includes 64 SP licenses and additional licenses cannot be purchased. The MergePoint SP5x00 manager includes 64 SP licenses and additional license keys (slave keys) can be purchased in increments of 64 or 128, with a maximum of 256 SP licenses per appliance.

To add service processor license keys (slave keys) to the MergePoint SP5x00 manager:

1. Click the *System* tab.
2. In the top navigation bar, click *Licenses*. The License window appears.
3. Click *Add Slave Key* and enter the key.
4. Click *Apply*.

To view the number of in use and free SP licenses:

Click the SP tab. The Managed SP list displays how many service processors are currently managed by the appliance and the number of remaining free licenses.

NOTE: An appliance license is also required to activate the MergePoint SP5x00 manager; see *Activating the MergePoint SP5x00 Manager License* on page 15.

Automatically Manage SPs

By default, you must add newly discovered service processors to the Managed SP list before you can access the device using the MergePoint SP manager; see *Managed and Unmanaged SP Lists (Admin users only)* on page 38. However, you may configure the System Settings to automatically add all newly discovered service processors to the Managed SP list.

To enable automatic management of SPs:

1. Click *System - Setting*.
2. If you want to automatically manage DHCP devices, select *Yes* for the related option.
3. If you want to automatically manage devices discovered from an IP address range, select *Yes* for the related option.
4. Click *Apply*.

Next steps:

- It's recommended to set the discovery time interval to five minutes. See *Discovering and Adding SPs (Admin Users Only)* on page 34.
- If you chose to automatically manage DHCP devices but have not configured the DHCP service, see *DHCP on the MergePoint SP Manager* on page 32.

Discovering and Adding SPs (Admin Users Only)

You can configure the MergePoint SP manager web interface to discover SPs that reside on the same LAN as the appliance by specifying up to two IP address ranges either for automatic or manual discovery. Discovered service processors are either displayed in the Unmanaged SP list or, if automatic management is enabled, added to the Managed SP list; see *Automatically Manage SPs* on page 34. Service processors in the Unmanaged SP list can be transferred to the Managed SP list.

You may designate up to two IP address ranges for discovery. The first time you access the SP window, the IP address ranges for the discovery setting are blank and may be modified by clicking *Edit*. You can also manually add an SP if you know its IP address.

For most SPs, you can view the type of SPs from the SP Profile column in the Unmanaged SP list. In a few cases, the SP profiles cannot be recognized until the SPs are managed and verified. For more details, see *Managed and Unmanaged SP Lists (Admin users only)* on page 38.

NOTE: To avoid MergePoint SP manager discover errors, ensure the following:
- RSA II, IBM Blade Center, and Sun ALOM servers must have SSH interfaces enabled.
- Dell iDrac 6 and DRAC 5 servers must have IPMI over LAN enabled.
- Since authentication is attempted for every Default SP User, ensure that this list contains only those users necessary to discover your servers. If the number of Default SP Users is not limited, some servers will lock out the discovery process after too many failed attempts.

To set discovery time interval:

1. Click the *SP* tab, then click *SP* in the top navigation bar.
2. Select *Discovery Setting*.
3. In the Time Interval field, type the value of minutes for the time interval.
4. Click *Apply*.

NOTE: The time interval is only used for the automatic discovery. The value of the time interval may be between 5 and 65535 minutes. The preset value is 30 minutes.

To discover SPs:

1. Click the *SP* tab, then click *SP* in the top navigation bar.
2. Select *Discovery Setting*, then click *Edit* next to the IP address range you wish to modify.
3. In the Subnet Edit window, define the range of IP addresses that will be searched during discovery.
4. Select either of the following start modes:

   For the MergePoint SP manager to automatically search for SPs in the specified IP address range at the specified time interval, select *Automatic*. If you wish to repeat the discovery sooner, click the *Start* link next to the IP address range.

   - or -

   If you want the MergePoint SP manager to search for SPs in the specified IP address range one time, select *Manual*.
5. Click *Apply*.
6. (Recommended for best system performance) Once all SPs are discovered, click *Stop* to end the automatic discovery process.

If you enabled automatic management (see *Automatically Manage SPs* on page 34), then discovery results are displayed in the Managed SP list. Otherwise, discovery results are displayed in the Unmanaged SP list. See *Managed and Unmanaged SP Lists (Admin users only)* on page 38.

Manually Adding a Single SP

If you already know the IP address of an SP, you may add it manually. In addition, you can require verification of a specified username and password when a user connects to the SP. Added SPs are displayed in the Managed SP list. A green checkmark indicates a verified SP, while a red X indicates an unverified SP. After SPs are added, the number of in use and free licenses is re-calculated.

To manually add an SP:

1. Click the *SP* tab, then click *SP* in the top navigation bar. The SP window appears.
2. Click *Manually Add SP*. The Manually Add SP window appears.
3. In the IP field, type the IP address of the new SP.
4. In the Alias field, type the alias for the new SP.
5. If you want to require a username and password when connecting to the SP, select *Verify username and password.*
   a. To use the preset credentials configured by the manufacturer, select *Use default username and password*.
      - or -
      To use a new username and password, select *Do not use default username and password* and enter the username and password in the corresponding fields.
   b. Select or deselect *Data Buffering* as desired. [To set SoL data buffering size, see *Configuring the MergePoint SP Manager System Settings (Admin Users Only) on page 46*].

   -or-

   If you do not want to require a username and password when connecting to the SP, select *Don't verify username and password.* You may specify the username and password in the corresponding fields for accessing other functions.

NOTE: If *Verify username and password* is selected, the username and password are checked when adding an SP and the Serial over LAN (SoL) session starts automatically. If *Verify username and password* is deselected, the username and password are not checked when adding an SP and the SoL session is not started.

NOTE: From the SP Profile drop-down menu, select the SP profile of the new SP.

6. (Optional) In the KG field, type the BMC key.

NOTE: The KG field only appears when you select *IPMI* from the SP Profile drop-down menu. A BMC key is required by IPMI 2.0 and RMCP+ (Remote Mail Checking Protocol).

7. (Optional) From the Cipher drop-down menu, select a value for the new SP.

NOTE: The Cipher drop-down menu only appears when you select IPMI(HP), IPMI(IBM), IPMI(Dell), FTS iRMC or FTS iRMC S2 from the SP Profile drop-down menu.

8. (Optional) From the Group Name drop-down menu, select a group for the new SP. The target device will be listed in the group folder in the side navigation bar.
9. From the SoL access type drop-down menu, select the SoL access type for the new target device.

NOTE: The SoL access type drop-down menu only appears when you select *iLO* from the SP Profile drop-down menu.

10. Click *Apply*. Discovery results are displayed in the Managed SP list in the SP window.

The settings of an SP can be modified on the Properties page of the SP. For more information, see *Changing SP parameters* on page 70.

NOTE: When an SP with a directcommnd-only SP profile is added to the MergePoint SP manager, a username and password is not required. In this case, you are not permitted to edit username and password related settings or require SP verification.

NOTE: The MergePoint SP manager connects an IBM RSA II SP through the Telnet protocol. Whenever an RSA II SP is managed by a MergePoint SP manager, one Telnet session remains open in the background for the SoL connection. A maximum of 2 concurrent Telnet connections may be open to an RSA II SP. To prevent session conflicts, you are not permitted to add a managed RSA II SP to another MergePoint SP manager.

Adding blade chassis and blades

You can manually add a blade chassis, such as an IBM BladeCenter, as an SP by entering the IP address of the blade chassis (see *Manually Adding a Single SP* on page 36). A blade chassis is server architecture that houses multiple server modules (blades) in a single chassis. The chassis provides the power supply and may have its own service processor, while each blade it contains may also have its own service processor.

When adding a blade chassis, all of its blades are added simultaneously if the following conditions are met:

- You specified that a verified username and password is required
- The username and password were successfully verified by the appliance
- Adequate free licenses for each blade are available

If these conditions are not met, only the blade chassis is added and the blades are not available. If more licenses are needed, you can first acquire the additional licenses and then click *Resync* to add the blades under the blade chassis.

Or, if an individual blade contains a supported service processor, you can add it to the MergePoint SP manager separately. In this case, the blade operates as an independent SP, not a subset of the blade chassis SP.

Managed and Unmanaged SP Lists (Admin users only)

If you enabled automatic management (see *Automatically Manage SPs* on page 34) or manually added an SP, then the service processors are displayed in the Managed SP list. Otherwise, discovery results are displayed in the Unmanaged SP list. You may add a service processor to the Managed SP list at any time, provided there is a free license. When you manage an SP, you can require verification of a specified username and password when a user connects to the device.

If the managed SP is part of a group or groups, it is displayed in the side navigation bar as part of the group folder(s).

NOTE: Users that do not have Administrator access will only see devices to which they have access.

For most SPs, you can view the type of SPs from the SP Profile column in the Managed/Unmanaged SP list. In a few cases, the SP profiles cannot be recognized until the SPs are managed and verified. See the following table for details.

Table 2.5: SP Profiles Displayed in the Managed/Unmanaged SP Lists

SP Profile	Display SP Profile - Unmanaged	Display SP Profile - Managed (Unverified)	Display SP Profile – Managed (Verified)
DELL 10G	IPMI2.0	IPMI 2.0	Dell 10G
HP IPMI	IPMI2.0	IPMI 2.0	IPMI(HP)

To add an SP to the Managed SP list:

1. Click the *SP* tab, then click *SP* in the top navigation bar. The SP window appears.
2. In the Unmanaged SP list, select the SP you wish to add and click *Manage*. The Input SP window appears.
3. If you want to require a username and password when connecting to the SP, select *Verify username and password.*

a. To use the preset credentials configured by the manufacturer, select *Use default username and password*.
- or -
To use a new username and password, select *Do not use default username and password* and enter the username and password in the corresponding fields.

b. Select or deselect *Data Buffering* as desired. (To set SoL data buffering size, see *Configuring the MergePoint SP Manager System Settings (Admin Users Only) on page 46).*

-or-

If you do not want to require a username and password when connecting to the SP, select *Don't verify username and password*. You may specify the username and password in the corresponding fields for accessing other functions.

NOTE: If *Verify username and password* is selected, the username and password are checked when adding an SP and the Serial over LAN (SoL) session starts automatically. If *Verify username and password* is deselected, the username and password are not checked when adding an SP and the SoL session is not started.

4. (Optional) Select *Group Name*. From the Group Name drop-down menu, select a group for the new SP. The SP appears in the group folder in the side navigation bar.
5. Click *Apply*.

NOTE: SP settings can be modified on the Properties page. For more information, see *Changing SP parameters* on page 70.

To delete an SP from the Managed/Unmanaged SP list:

1. Click the *SP* tab, then click *SP* in the top navigation bar. The SP window appears.
2. In the appropriate SP list, select the SP you wish to delete and click *Delete*.

NOTE: When a managed SP is deleted, a license is set free. The number of in use and free license is re-calculated.

To remove an SP from the side navigation bar:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.
3. In the top navigation bar, click *Target*. A window displaying SP information appears.
4. Click *Remove*. When prompted, confirm the remove action. The selected SP is removed from the side navigation bar.

To add an SP to a group:

1. In the side navigation bar, click an SP name.

2. Click the *Properties* tab.
3. In the top navigation bar, click *Target*. A window displaying SP information appears.
4. To add the SP to a group, click *Copy To*. From the Group drop-down menu, select a group. The SP is added to the new group and remains in the current group.

   -or-

   To move the SP to a new group, click *Move To*. From the Group drop-down menu, select a group. The SP is added to the new group and removed from the current group.
5. Click *Apply*.

Managing SP Groups (Admin users only)

You may create groups for managed SPs, which allows you to perform operations on all devices in a group at the same time. You may create an unlimited number of groups, and the same SP may be a part of multiple groups.

A default SP group with the same name as the MergePoint SP manager alias is automatically created for you. In the side navigation bar, the appliance, SPs and SP groups are displayed in the explorer tree according to hierarchy. Group folders and SPs that are part of the appliance alias group are displayed one level below the MergePoint SP manager. SPs that are members of groups are displayed one level below the corresponding group folder.

To add a new SP group:

1. Click the *SP* tab, then click *Groups* in the top navigation bar.
2. Click *Add*.
3. In the Group Name field, type a name for the group, then click *Apply*.

To modify an SP group name:

1. Click the *SP* tab, then click *Groups* in the top navigation bar.
2. In the Group list, click the name link you wish to modify.

   - or -

   Click a group name from the explorer tree in the side navigation bar, click *Configuration* in the top navigation bar, then click *Modify Name*.
3. In the Group Name field, type a name for the group, then click *Apply*.

To delete an device group:

1. Click the *SP* tab, then click *Groups* in the top navigation bar.
2. In the Group list, select the group you wish to delete, then click *Delete*.

- or -

Click a group name from the explorer tree in the side navigation bar, click *Configuration* in the top navigation bar, then click *Delete*.

To add a managed SP to an SP group:

1. Click the *SP* tab, then click *SP* in the top navigation bar.
2. In the Managed SP list, select the SP you wish to add to a group, then click *Add SP to Group*.
3. From the Group Name drop-down menu, select the group to which you wish to add the SP, then click *Apply*.

To configure SP group actions:

1. Click *System - Setting*.
2. Enter the number of SPs to power on simultaneously in a group.
3. Enter the time interval in seconds to elapse between power on each SP in a series of grouped SPs.
4. Enter the number of SPs to turn off simultaneously in a group.
5. Enter a command delay to turn off units in a series (seconds).
6. Click *Apply*.

Managing SP Profiles (Admin users only)

The MergePoint SP manager supports two types of SP profiles: default and user. Default SP profiles define 18 default profiles of SPs, while user SP profiles define new SP profiles. The Admin user can view the settings of the default SP profiles and create, modify or delete a user SP profile. You may need to create a new SP profile if an SP does not work properly with any of the default SP profiles.

The SP profile provides parameters, values or functions of SPs, such as:

- Protocol: used for communications between the MergePoint SP manager and SPs.
- Family: contains a list of pre-defined SP profiles and customX (X=1, 2, 3) SP profiles.

NOTE: The customX family needs a new Expect script which has been created using the name talk_customX.exp. (For more on creating new Expect scripts, see *Profile Configuration* on page 206.

- Command Template: contains a list of templates for SP profiles. You may create a new template by clicking *SP Templates Configuration*. A MindTerm session will activate the sptemplate utility. See *To use the sptemplate utility to create a new template:* on page 211.

The new template is added to lists of command templates and becomes available for using when configuring SPs. The following SP profiles do not need a template:

- IPMI SPs.
- SPs being configured only for Native IP access.
- SPs being configured only for DirectCommand access.

- DirectCommand Options: contains values to be used when DirectCommand is launched. The DirectCommand feature allows transparent access to native TCP services on an SP, such as a Virtual Media interface or a native KVM implementation. You may configure up to 20 TCP service ports to set up port forwarding for DirectCommand.

When adding a new SP, an Admin user should follow the procedure under *To find out if an existing command template works with a new SP:* on page 210to see if one of the default command templates works with the new SP. If not, an Admin user can use the MergePoint SP manager to either modify an existing user SP profile or create a new one.

To configure a new SP profile:

1. Click *SP - SP Profiles*.
2. In the User SP Profiles area, click *Add*.
3. In the SP Profile window, specify the name, protocol, family and SP template for the new SP profile.

NOTE: SP profile names may only contain letters and numbers. Special characters, such as a space or slash, are not permitted.

NOTE: The SP template for the profile must be the same template used for the family you chose. New SP templates that you create will appear here. For more information, see *To use the sptemplate utility to create a new template:* on page 211

4. Configure the DirectCommand parameters for the accessing the web interface of the SP profile by selecting a web scheme of *http* or *https*, entering a web port and entering the web address.
5. Configure TCP parameters for accessing TCP service on the new SP profile:
   a. In the TCP Port field, type the TCP service port you want to access.
   b. In the Description field, type the description of the service you are configuring.
   c. In the Warning drop-down menu, select *Yes* or *No*.

NOTE: You may configure up to 20 TCP ports.

6. Click *Apply*. The new SP profile will be displayed in the User SP Profiles list.

To view the settings of the default SP profiles:

1. Click *SP - SP Profiles*.
2. Select the desired SP profile in the Default SP Profiles area.

To delete user SP profiles:

1. Click *SP - SP Profiles*.
2. In the User SP Profiles list, select the SP profile you wish to delete and click *Delete*.

To modify a user SP profile:

1. Click *SP - SP Profiles*.
2. In the User SP Profiles list, click the name link for the SP profile you wish to modify and enter the new information.
3. Click *Apply*.

Managing Default Users (Admin users only)

To perform management operations through a MergePoint SP manager, a username and password are required to access the SP. To simplify the authentication process, you may configure a default username and password for specific SPs. When a management operation is requested, the MergePoint SP manager searches the entire list of default usernames to see if there is an appropriate one for accessing the SP. You may create multiple entries of the same username with a different password for each. One preset username and password for each type of SP is created by default.

Table 2.6: Default Service Processor Usernames and Passwords

Type	Username	Password
IPMI 1.5	admin	admin
IPMI 2.0	admin	admin
IBM RSA II	USERID	PASSW0RD
IBM BladeCenter	USERID	PASSW0RD
DELL DRAC 3	root	calvin
DELL DRAC 4	root	calvin

Type	Username	Password
DELL DRAC 5	root	calvin
DELL 10G	root	calvin
HP IPMI	admin	admin
HP iLo1	admin	opensource
HP iLo2	[no default]	[no default]
SUN iLom	root	changeme
SUN Alom	admin	admin
Fujitsu Siemens iRMC	admin	admin
DELL DRAC MC	root	calvin
DELL iDRAC SP	root	calvin
DELL m1000e CMC	root	calvin
HP BladeCenter	Administrator	admin
SUN ELOM	root	changeme
Fujitsu Siemens iRMC S2	root	password

NOTE: This feature is not supported on target devices equipped with iLO.

NOTE: The maximum number of default SP users is eight.

NOTE: Do not use reserved words for usernames. Reserved words that have special meaning for the MergePoint SP manager are listed in *Managing MergePoint SP Manager User Accounts* on page 29.

To add a default user:

1. Click *SP - Default SP User - Add*.
2. Specify the information for the default SP user and click *Apply*.

To delete a default user:

1. Click *SP - Default SP User*.
2. Select the user you wish to delete and click *Delete*.

To edit a default user:

1. Click *SP - Default SP User*.
2. Click the username you want to modify.

Managing user accounts on SPs

The Users window lists all user accounts for the selected SP. MergePoint SP manager users with Admin privileges may change user account information on SPs.

NOTE: This feature is available for SPs that have user management functions. Different types of devices have different user management systems. For example, while some may allow adding, editing and deleting user accounts, others may only allow editing user accounts.

To edit a user account:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Users*.
4. Click the name of the user you want to modify or the *Edit* link next to the user.
5. Enter the desired changes, then click *Apply*.

To create a new user account:

NOTE: Some SPs support limited users. In this case, you are not able to add a new line of user information. However, you may create a new user account by defining a username, password and user privilege to a user that does not have a username.

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Users*.
4. Click *Add* or click *Edit* next to a user without a username.
5. Enter the desired changes, then click *Apply*.

To remove a user account:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Users*. The Users window appears.
4. Select the user to be deleted and click *Delete*.

   -or-

Click *Remove User* next to the user you wish to remove.

NOTE: The line of the removed user will not disappear from the user list. Instead, it will become a user without a username that has Guest user privilege (no matter which user privilege it had before).

Configuring the MergePoint SP Manager System Settings (Admin Users Only)

To change the MergePoint SP manager alias:

1. Click *System - Setting*.
2. In the Alias field, type the new name for the MergePoint SP manager and click *Apply*.

To set target BMC time (for IPMI SPs only):

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, select *Time*. The Set Time window appears.
4. To synchronize the BMC time with the appliance time clock, select *Sync with Appliance*.

   -or-

   To synchronize the BMC time with the console time clock, select *Sync with Client PC*.

   -or-

   To specify the BMC time, select *Other* and select the time from the pop-up calendar.
5. Click *Apply*.

To set the session time interval and SoL history size:

1. Click *System - Advanced Setting*.
2. Input the desired settings in the fields provided and click *Apply*.

NOTE: The minimum session time interval is 600 seconds (10 minutes) and the maximum is 18,000 seconds (5 hours). The maximum SoL buffer size is 2 GB.

To set the MergePoint SP manager time:

1. Click *System - Advanced Setting*.
2. Select *Synchronize with Client PC* to synchronize the MergePoint SP manager time with the client PC.

   - or -

   Select *Other* and specify the MergePoint SP manager time from the pop-up calendar.
3. Click *Apply*.

To set the Internet time server:

1. Click *System - Advanced Setting*.
2. In the Internet time server field, enter the Internet time server address.
3. (Optional) Click *Update Now* to immediately synchronize the MergePoint SP manager with the Internet time server.
4. (Optional) Select *Automatically synchronize with an Internet time server* to synchronize the MergePoint SP manager with the Internet time server every 36 hours.
5. Click *Apply*.

To set MergePoint SP manager time zone:

1. Click *System - Advanced Setting*.
2. Select a time zone other than Custom from the Appliance Time Zone drop-down menu.
3. Click *Apply*.

NOTE: The Appliance Current Time field displays the current appliance time in the local time zone, based on the time zone location settings on your client PC. If you change the MergePoint SP manager time zone, but do not change any other time settings such as the appliance time or client PC time zone, the Appliance Current Time is not affected and the value in the field does not change.

To configure the MergePoint SP manager for a customized time zone:

1. Click *System - Advanced Setting*.
2. Select *Custom* from the Appliance Time Zone drop-down menu.
3. Click *Edit Custom*.
4. In the Timezone name field, type the name of the time zone.
5. In the Standard Time Acronym field, type a standard acronym for the time zone.
6. In the GMT offset drop-down menu, select the GMT offset.
7. (Optional) Select *Enable daylight saving time* if you would like to configure the MergePoint SP manager with DST.
    a. In the DST Acronym field, type the daylight saving time (DST) acronym of your choice.
    b. In the Saving time drop-down menu, select the number of hours and minutes in the HH:MM format. The clock will be reset at the beginning of the daylight saving time period.

c. In the DST start fields, select the start dates of daylight saving time from the pop-up calendar.

d. In the DST end fields, select the end dates of daylight saving time from the pop-up calendar.

8. Click *Apply*.

To enable or disable the Telnet or SSH protocol:

1. Click *System - Setting*.
2. Select or deselect *Telnet* or *SSH* to enable/disable the respective protocol.
3. Click *Apply*.

NOTE: (For the MergePoint SP5x24/SP5x40 manager ONLY) In some cases, such as soon after an upgrade, enabling the SSH protocol may be delayed while the service processor initiates.

Completing the MergePoint SP Manager Installation

Whatever method is used to enable access to the web interface, the root user should always log into the MergePoint SP manager console and change the password from the default. The admin user cannot change the root user password, and the root user cannot log into the web interface to change the root password. The following options are available:

- Until an IP address is available for the MergePoint SP manager, the root user can only change the root user password by logging in locally through the console port.
- After an IP address is available for the MergePoint SP manager, the remote root user can use SSH to connect to the console and log in from a remote location and change the password.

CHAPTER 3

Operations

The operations in this chapter are performed using the MergePoint SP manager web interface. For instructions on using the MergePoint SP manager with DSView 3 software, please see the DSView 3 Software Installer/User Guide.

When the MergePoint SP manager is selected in the side navigation bar, a line of tabs and sub-tabs appears in the tab bar. They vary according to the user access level. For users without administrator access, only the SP, Users and Alerts tabs are available.

- SP: Used to display and manage discovered SPs.
- System: Used to define or change MergePoint SP manager settings.
- Network: Used to configure MergePoint SP manager network settings.
- Users: Used to manage MergePoint SP manager user accounts.
- Alerts: Used to view, query and activate system alerts.
- Accounting Log: Used to view all MergePoint SP manager operations.
- Diagnostic: Used to collect all network packets between an SP and a MergePoint SP manager for troubleshooting and problem resolution.

Using the MergePoint SP Manager

The operations described in this chapter are performed through the MergePoint SP manager web interface. For installations involving multiple MergePoint SP managers, the same functions can be accessed through the DSView 3 software. For information on using the DSView 3 software with the MergePoint SP manager, please see the DSView 3 software installer/user guide and the online help for the MergePoint SP manager plug-in.

MergePoint SP manager web interface

You can connect to the MergePoint SP manager web interface using any of the following web browsers or their later releases: Internet Explorer 6.0 SP1 or later, Internet Explorer 7, Firefox 2.0

or later, Mozilla 32-bit version 1.7.3 or later, or Mozilla 64-bit.

To access the MergePoint SP manager web interface:

1. Open a web browser and enter the IP address of the MergePoint SP manager.
2. Enter your username and password and click *Login*.

NOTE: When following any of the MergePoint SP manager configuration procedures in this document, start by clicking the name of the MergePoint SP manager in the side navigation bar. Click *Apply* to save changes. To cancel changes, click *Back* to return to the previous screen or click another navigation element, such as the name of a tab, window or target.

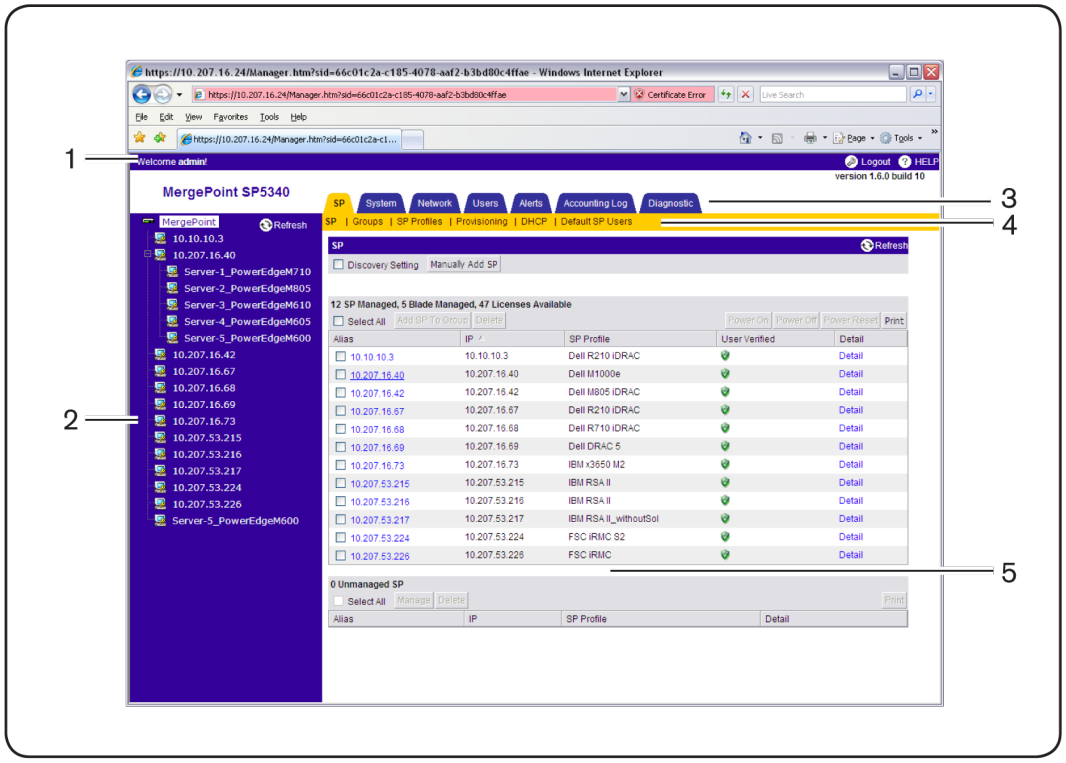

Figure 3.1: MergePoint SP Manager Web Interface

Table 3.1: MergePoint SP Manager Web Interface Descriptions

Number	Window Area	Description
1	Top Option Bar	Use the top option bar to log out or access online help. If any alerts occur, a yellow icon is displayed. The name of the logged in user appears on the left side of the top option bar.
2	Side Navigation Bar	Use the side navigation bar to select the appliance or SPs and access or edit corresponding information in the content area.
3	Tab Bar	Use the tab bar to display and manage the MergePoint SP manager, managed groups and SPs.
4	Top Navigation Bar	The selections in the top navigation bar vary, depending on the active tab in the tab bar.
5	Content Area	The content area displays information relative to your selections and allows you to make changes to the MergePoint SP manager, managed groups or SPs.

Remote Power and Chassis Management

Using the MergePoint SP manager, you may view the power status and the status of the chassis indicator LED (if available) on managed target devices, manage power and turn the LED on and off remotely. You may also initiate cold reset and BMC self test operations on certain types of SPs.

The effects of Power Off and Power Cycle commands differ among service processor vendors. For a hard power command, power is turned off immediately, while a soft command shuts down the operating system before turning off the SP. If a service processor provides more than one of the options, the MergePoint SP manager performs the hard power option by default.

The options for the reset command also differ, and are defined as warm reset and cold boot. For a warm reset, only the operating system is restarted while a cold boot issues a power cycle command. In cases where both options are available, the MergePoint SP manager will use cold boot.

NOTE: In addition, for Dell 10G SPs, you can view power tracking statistics and peak statistics by clicking *Power Monitoring*.

To view and control the power status:

1. In the side navigation bar, click an SP name.

2. Click the *System* tab.
3. In the top navigation bar, click *Power*. The Power Information window appears and displays the current power status of the target device.
4. Following the instructions on the page, select the desired power action: *Power On*, *Power Off*, *Graceful Shutdown*, *Power Reset*, *Power Cycle* and *Soft Reset*.

To monitor power for a Dell 10G SP:

1. In the side navigation bar, click an SP name.
2. Click the *System* tab.
3. In the top navigation bar, click *Power Monitoring*.

NOTE: Make sure the correct SP profile is selected for the Dell 10G SP; otherwise, the Power Monitoring tab is not visible. To modify the SP profile, see *Changing SP parameters* on page 70.

To turn on, turn off or reset all selected SPs:

1. Click the *SP* tab, then click *SP* in the top navigation bar. The SP window appears.
2. In the Managed SP list, select the SP(s) you wish to manage and click the desired power operation.

To view and control the chassis status (LED):

1. In the side navigation bar, click an SP name.
2. Click the *System* tab.
3. In the top navigation bar, click *Chassis*. The Chassis Information window appears and the current chassis status of the target device is displayed.
4. To modify how often the LED flashes, enter the number of seconds in the Indicator ON Seconds field.
5. To change the chassis indicator status of the target device, complete any of the following steps:

   To turn the LED on and leave the LED flashing for a specified number of seconds, click *Indicator On Seconds*. The LED flashes for the time specified in the Indicator On seconds field.

   - or -

   To turn the LED on and leave the LED flashing permanently, click *Indictor On*.

   - or -

   To turn the LED off, click *Indicator Off*.

6. Click *Apply*.

To perform a cold reset on an SP:

1. In the side navigation bar, click an SP name.
2. Click the *System* tab.
3. In the top navigation bar, click *Advanced Tools*. The Setting window appears.
4. Click *Cold Reset* to perform a cold reset on the selected SP. A message will appear to indicate the success status of the cold reset.

To reboot the MergePoint SP manager:

Click *System – Setting - Apply Reboot*.

NOTE: If the network setting mode is DHCP, when you reboot the appliance it attempts to obtain an IP address from the DHCP server. If a DHCP server is not present or is unavailable, the following IP address are automatically assigned: 192.168.0.10 for eth0 and 192.168.0.20 for eth1.

To shut down the MergePoint SP manager (Admin users only):

CAUTION: Clicking *Shutdown* immediately stops all active services and sessions.

1. Select *System - Setting,* then click *Shutdown*.
2. (Optional) Wait one minute, or until you see the shutdown message in the console interface or hear a beeping noise, then unplug the appliance.

Performing SP Group Operations

Admin users may perform the following operations for all SPs in a group at the same time: turn on, turn off or reset the devices, turn the target device LED indicators on or off, and configure time, Platform Event Trap (PET) alert settings, usernames and passwords.

You can also move or copy SPs from one group to another, and remove SPs from a group.

NOTE: A group must contain at least one SP before you can perform a group operation.

To turn on, turn off or reset all SPs in a group:

1. Click *SP - Group*.
2. Select the group(s) you wish to modify and click the desired power operation.

   - or -

   Click a group name from the explorer tree in the side navigation bar, click *Action* in the top navigation bar, then click the desired power operation.

To turn LED indicators on or off for all SPs in a group:

1. Click *SP - Group*.
2. Select the group(s) you wish to modify and click the desired indicator state.

   - or -

   Click a group name from the explorer tree in the side navigation bar, click *Action* in the top navigation bar, then click the desired indicator state.

To set the time for all SPs in a group:

1. Click *SP - Group*.
2. Select the group(s) you wish to modify and click *Set Time*.

   - or -

   Click a group name from the explorer tree in the side navigation bar, click *Action* in the top navigation bar, then click *Set Time*.
3. To synchronize the SPs with the MergePoint SP manager time clock, select *Synchronize with Appliance*.

   -or-

   To synchronize the SPs with the client PC time clock, select *Synchronize with Client PC*.

   -or-

   To specify the time, select *Other* and select the time from the pop-up calendar.
4. Click *Apply*.

To change the PET alert settings for all SPs in a group:

1. Click *SP - Group*.
2. In the Group list, select the group(s) you wish to modify and click *PET Setting*.

   - or -

   Click a group name from the explorer tree in the side navigation bar, click *Action* in the top navigation bar, then click *PET Setting*.
3. Perform any of the following steps:
   a. Enable or disable *Send Alerts*. Enabling this function allows the BMC to send alerts when events occur.
   b. In the Community String field, type the value that will be displayed in the PET trap community string field.

c. Type up to four IP addresses in the Alert Destination IP Address fields.

NOTE: To allow the MergePoint SP manager to receive alerts from the SP, one field should contain the IP address of the MergePoint SP manager.

4. Click *Apply*.

To set a user and password for all SPs in a group:

1. Click *SP - Group*.
2. In the Group list, select the group(s) you wish to modify and click *Set User and Password*.

   - or -

   Click a group name from the explorer tree in the side navigation bar, click *Action* in the top navigation bar, then click *Set User and Password*.
3. Enter the requested information and click *Apply*.

To manage SP groups:

1. Click a group name from the explorer tree in the side navigation bar.
2. Select the SP(s) you wish to copy or move.
3. Click the corresponding button and follow the on-screen instructions.

Monitoring and Management

Viewing sensor status

The MergePoint SP manager can detect the status of fan, temperature and voltage sensors on managed SPs. By clicking the *Sensor* tab, you may view a detailed report of a device's sensors that includes the sensor name, type, current reading and status.

NOTE: For some types of SPs, you can change a temperature scale to view sensor information.

To view sensor status:

1. In the side navigation bar, click an SP name.
2. Click the *Sensor* tab.
3. In the top navigation bar, click *Sensor*. The Sensor window and a detailed list of sensors and corresponding information appears.

Viewing SEL events

You may use the MergePoint SP manager to view the SEL (System Event Log) on a managed SP.

To view SEL events:

1. In the side navigation bar, click an SP name.
2. Click the *SEL* tab.
3. In the top navigation bar, click *SEL*. The SEL window and a detailed SEL event list appears.

To clear the SEL events:

1. In the side navigation bar, click an SP name.
2. Click the *SEL* tab.
3. In the top navigation bar, click SEL. The SEL window appears.
4. Click *Clear All*. All currently listed events are removed from the list.

Viewing IML events

You may use the MergePoint SP manager to view the IML (iLO Management Log) on a managed iLO SP.

To view IML events:

1. In the side navigation bar, click an iLO SP name.
2. Click the *IML* tab.
3. In the top navigation bar, click *IML*. The IML window and a detailed IML event list appears.

To clear the IML events:

1. In the side navigation bar, click an iLO SP name.
2. Click the *IML* tab.
3. In the top navigation bar, click IML. The IML window appears.
4. Click *Clear All*. All currently listed events are removed from the list.

Viewing the accounting log

The accounting log records and displays all MergePoint SP manager operations. The WEB accounting log displays operations performed using the MergePoint SP manager web interface. The Mgpshell accounting log displays operations performed using Mgpshell. Detailed information including operation time, login username, operation type, SP and console IP are displayed in the accounting log.

To view the accounting log (Admin users only):

1. Click the *Accounting Log* tab.
2. Click *WEB* to view operations performed through the MergePoint SP manager web interface.

   -or-

   Click *Mgpshell* to view operations performed through the Mgpshell.

Import/export data

This function allows you to backup and restore the MergePoint SP manager by exporting the data to the client PC or a storage location on the network.

NOTE: See the MergePoint SP manager release notes for more information about restoring data in MergePoint SP manager.

To export data from the MergePoint SP manager (Admin users only):

1. Click the *System - Import/Export*.
2. Click *Export*. All MergePoint SP manager data will be compiled and a download link will appear next to the Export button.
3. Click *download* to save the data file to the desired location.

To import data to the MergePoint SP manager (Admin users only):

1. Click *System - Import/Export*.
2. In the Filename field, type the path to the file you wish to import or click *Browse* to locate the file.
3. Click *Import* to restore the data in the file to the MergePoint SP manager.

Accessing FRU information

The MergePoint SP manager can find and display some Field Replaceable Unit (FRU) information for the selected SP, including chassis type, board language code and product name.

NOTE: Not all service processors support or log FRU information. If the FRU information report does not appear, ensure that the server manufacturer supports and/or has logged FRU data.

To retrieve FRU information:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.

3. In the top navigation bar, click *FRU Information*. A detailed FRU information report appears.

Using the Alerts Viewer

The MergePoint SP manager logs user-defined alerts that occur on managed SPs in the Alert Viewer window. You may configure the MergePoint SP manager to send a notification by email, MSN, SNMP Forward or Yahoo! message when specific alerts occur.

The Alerts Viewer window displays alerts and the corresponding date/time, source, IP address, event type and severity level. Alerts set as read will be listed in black; alerts not set as read will be listed in red. Click *Detail* next to an alert to view additional information.

To locate specific alerts, you may specify parameters to query the list of alerts. Users can also search alert messages through a query analyzer. The query parameters include occurrence period, IP address, event type, severity level and read status.

Setting an alert action

You may create an alert action by configuring action parameters to your specifications. You may also configure the MergePoint SP manager to send email, MSN messages or Yahoo! messages to specific users, or forward SNMP messages to specific SNMP trap browsers or management software once an alert occurs.

Before creating an alert action, configure the action settings to allow for alert notifications.

To configure action settings (Admin users only):

1. Click the *Alerts* tab.
2. In the top navigation bar, click *Action*.
3. Click *Action Setting*.
4. Specify the following parameters:
    a. In the SMTP Server field, type the Simple Mail Transfer Protocol (SMTP) server address for sending email.
    b. In the SMTP Server Account field, type the account used as the email sender.
    c. In the SMTP Server Password field, type the password for the SMTP server account.
    d. In the SMTP Sender field, type the display name of the email sender.
    e. In the MSN User field, type the MSN account used as the MSN message sender.
    f. In the MSN Password field, type the password for the MSN user.

g. In the YAHOO IM User field, type the YAHOO IM account used as the YAHOO IM message sender.

h. In the YAHOO IM Password field, type the password for the YAHOO IM account.

5. Click *Apply*.

To create an alert action (Admin users only):

1. Click the *Alerts* tab.
2. In the top navigation bar, click *Action*.
3. Click *Add*.
4. In the Action Configuration area, specify the following information:

   a. Select the Action Type from the drop-down menu: *Email, MSN, YAHOO* or *SNMP Forward*.

   b. If you selected *Email*, type the email address of the receiver in the Email Address field.

   -or-

   If you selected *MSN*, type the MSN account of the receiver in the Email Address field.

   -or-

   If you selected *SNMP Forward*, type the IP address of the destination machine in the Receiver field.

   -or-

   If you selected *YAHOO*, type the YAHOO IM account of the receiver in the YAHOO field.

5. Click *Apply*.

To delete an alert action (Admin users only):

1. Click the *Alerts - Action*.
2. From the list, select the action(s) you wish to delete and click *Delete*.

To query an alert (for all users):

1. Click the *Alerts* tab.
2. In the Alert Viewer area, select *Show Alert Query*.
3. In the Alert Query area, specify any or all of the following parameters for the query:

   a. Select *Period From* to enable date range fields.

b. In the Period From and To fields, type the date range for the alerts you wish to be included in the query results. The default value of the To field is the current date.

c. From the IP address drop-down menu, select either *All* or a specific IP address for the SPs you wish to be included in the query results.

d. From the Severity drop-down menu, select the severity of the alerts you wish to be included in the query results: *All, Specified, Monitor, Information, OK, NonCritical, Critical* or *Non-Recoverable.*

e. From the Read Status drop-down menu, select the read status of the alerts you wish to be included in the query results: *All*, *Read* or *Unread*.

4. Click *Query* to search the alerts. The qualifying alerts will be displayed in a list below the Alert Query area.

To set an alert as read (Admin users only):

1. Click the *Alerts* tab.
2. From the list, select the unread alerts you wish to modify.
3. Click *Set Selected Read* to mark the selected alerts as read. The alerts change from red to black text to indicate the read status.

To delete an alert (Admin users only):

1. Click the *Alerts* tab.
2. From the list, select the alerts you wish to delete.
3. Click *Delete Selected* to remove the alerts from the Alerts Viewer list.

Syslog

The Admin user can set up logging of messages about the following types of events:

- Events of interest from the MergePoint SP manager
- Events of interest obtained by filtering data during device console connections with connected devices
- Sensor alarms generated by sensors on SPs

Messages can be sent to a user defined destination. Messages can also be sent to the console, the root user or both.

Message filtering levels

Messages can be filtered according to their severity, based on any or all of the levels from the following list.

- 0 - Emergency
- 1 - Alert
- 2 - Critical
- 3 - Error
- 4 - Warning
- 5 - Notice
- 6 - Info
- 7 - Debug

Configuring syslog messages

To configure syslog message filtering:

1. Click *System - Syslog*.
2. Select the link of the filter name which you want to modify.
3. Click the checkboxes next to the desired severity levels.
4. Click *Apply* to finish.

To configure the syslog destination:

1. Click *System - Syslog*.
2. In the System Destination area, select *Console* to send the system kernel log (such as [date] src_kernel@MergePoint ...or [date] scr_dev_log@MergePoint...) to the console.

   -and/or-

   Click *Root user* to send messages to the root user.
3. In the User Define Destination area, configure messages to be sent to a defined syslog server as follows.
   a. Click *Add*.
   b. In the Syslog Destination field, type a syslog server's IP address.
   c. Click *Apply*.
   d. To add additional syslog servers, repeat steps a through c.

NOTE: You can edit or delete syslog servers by selecting the corresponding destination and clicking *Delete*.

Configuring PET alerts

Users with Admin privileges may configure PET alerts separately for each SP.

To configure PET alerts:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Event Destination*. The PET Setting window appears.
4. Select *Enable* or *Disable* for sending or not sending alerts when specific events occur.
5. In the Community String field, enter the value to be displayed in the community string field of the PET trap.
6. Enter up to four IP addresses in the Alert Destination IP Address fields.
7. Click *Apply*.

NOTE: To configure the MergePoint SP manager to receive alerts for the SP, make sure to enter the IP address of the MergePoint SP manager in one of the Alert Destination IP Address fields.

Schedules

Tasks can be scheduled to simultaneously turn on or off or reset the power on all SPs in a group. The results of each scheduled task display in the Schedule Task Result list in the Schedule Task window. To clear this list, click *Clear All*.

Schedule a task (Admin users only)

To schedule a task:

1. Click *System - Schedules*.
2. Click *Add* and select *Group* to display all SP groups or SPs to display all SPs.
3. Specify the following information:
   a. Select the group(s) or SP(s) for which you wish to schedule tasks.
   b. Type the task name into the Task Name field.
   c. From the Operate drop-down menu, select: *Power On*, *Power Off* or *Power Reset*.
   d. From the Schedule Task drop-down menu, select: *Once*, *Daily*, *Weekly* or *Monthly*.

e. From the Time menu(s), select the day, hour and minute for the task to occur. Options in the Time menus vary according to your selections.

f. Choose *Once*, *Daily*, *Weekly* or *Monthly*, then specify the task schedule accordingly.

4. Click *Apply*.

To edit a scheduled task:

1. Click *System - Schedules*.
2. Click *Edit* next to the task you wish to edit and follow the on-screen instructions.

To delete a scheduled task:

1. Click *System - Schedules*.
2. Select the task to delete and click *Delete*.

SNMP Access

The SNMP agent provides access to the MergePoint SP manager through an SNMP management application, such as HP Openview, Novell NMS, IBM NetView or Sun Net Manager, and provides proxy access to SNMP data from connected service processors that implement SNMP agents.

NOTE: The SNMP agent can also be configured to send notifications (also known as traps) about significant events on the MergePoint SP manager and on SPs. See *Using the Alerts Viewer* on page 58.

The administrator must configure the SNMP agent to use the version of SNMP supported by the management application, SNMP v1, v2c or v3. The use of v3 is strongly encouraged wherever possible because it provides authentication and encryption of data that is lacking in v1 and v2c.

Access to information provided by the MergePoint SP manager and its proxy SPs can be obtained in either of the two following ways:

- The recommended access method for agents which support only SNMP version 1 or 2c is through a proxy on the MergePoint SP manager. The MergePoint SP manager provides the authentication and encryption lacking in those protocol versions. The SNMP management application can then be used for SNMP management of the SP.

NOTE: Running the SNMP daemon (snmpd) on the MergePoint SP manager allows you to access the proxy data using the v1 and 2c protocols without going through a VPN tunnel. However, this method is inherently unsecure.

- The access method agent which supports version 3 is via a local Net-SNMP daemon. The proxying of traps is not supported by Net-SNMP.

If SNMP is used as recommended, no public client is allowed unauthenticated access to either managed clients or to the MergePoint SP manager. For compatibility with other clients, unencrypted transfer of data is possible with SNMP v3 connections, but strongly discouraged.

- User and group information for v3 connections must be different from the user and group names used for accessing the MergePoint SP manager.

The administrator can configure the following:

- General information provided by the MergePoint SP manager, including location and contact fields
- Who has access to SNMP information

Configuring SNMP on the MergePoint SP manager

The Admin user can configure SNMP access for the MergePoint SP manager by clicking Network - SNMP.

To configure the MergePoint appliance SNMP settings:

1. Click *Network - SNMP*.
2. In the SysContact field, type the contact information of the MergePoint SP manager administrator.
3. In the SysLocation field, type the location of the MergePoint SP manager.
4. Click *Apply*.

To configure views:

NOTE: Use the view settings to determine what information is shown when the SNMP request is returned. Multiple views can be created. The views configured in this procedure for the MergePoint appliance are also used for the SNMP requests to the SP.

1. Click *Network - SNMP*.
2. In the View area, click *Add*, then enter a name for the view.
3. Select *Include* or *Exclude* from the drop-down menu to include or exclude the defined OID subtree.
4. Enter an OID for the object to be viewed and enter a mask to create an OID subtree in the fields provided. Repeat to create more OID subtrees as desired.

NOTE: If the OID is numeric, a prefix of a decimal point is required. For example, type **.1.3** instead of 1.3.

5. Click *Apply*.

NOTE: You may edit or delete an existing view by clicking the view name link and following the on-screen instructions.

To configure users with SNMP v3:

1. Click *Network* - *SNMP*.
2. In the Users area, click *Add*, then type a username.
3. Select an authentication method from the Auth method drop-down menu, then enter an optional authentication password.
4. Select an encryption method from the Encryption drop-down menu, then enter an optional encryption password.
5. Click *Apply*.

NOTE: You may edit or delete an existing user by clicking the username link and following the on-screen instructions.

To configure access settings for SNMP users:

Perform this procedure to configure how users on the public side authenticate themselves to the MergePoint SP manager.

1. Click *Network* - *SNMP*.
2. In the Access settings area, click *Add*.
3. From the SNMP version drop-down menu, select a version.
4. If either the v1 or v2c version is selected in step 3, perform the following steps:
   a. In the Community field, type the public community name to be used by the external SNMP application.
   b. Select either *Default* or *Use IP* for the source.

NOTE: The Source field limits the IP address permitted to access the MergePoint SP manager through SNMP. If Default is selected, any IP address can access the appliance, but if Use IP is selected, only the specified IP address can access the appliance.

   c. If Use IP is selected, type a source IP address.
   d. Select an appropriate view for the Read and Write view settings. If the list is empty, no view has been configured; see *To configure views:* on page 64.

   -or-

   If the v3 version is selected in step 3, perform the following steps:

a. Select a user from User drop-down menu. See *To configure users with SNMP v3:* on page 65 for more information.

b. For each security level, select a read view and write view under the Read view and Write view columns. If the list is empty, no view has been configured; see *To configure views:* on page 64.

5. Click *Apply*.

NOTE: You may edit or delete an existing access setting by clicking the *Community/User* link and then following the on-screen instructions.

Configuring SNMP on the service processor

The Admin user can configure SNMP access on SPs by selecting the SP and then selecting the *Configuration - SNMP* tab. If the SP does not support SNMP, the SNMP tab is not displayed on the SP configuration page.

To configure service processor SNMP settings:

NOTE: The following settings must match the SNMP configuration of the SP. The MergePoint SP manager does not automatically set or configure the SNMP settings in the SP.

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *SNMP*. The SNMP window appears.
4. In the OID field, type the identifier for the object to be managed. An OID may be provided for you as starting point, but ensure that the correct OID for the SP is entered in this field.

NOTE: If the OID is numeric, a prefix of a decimal point is required. For example, type **.1.3** instead of 1.3.

5. From the SNMP version drop-down menu, select *v1*, *v2c* or *v3*. The version you select must match the version configured on and supported by the SP.
6. If you selected either *v1* or *v2c*, type the community name in the Community field. When the MergePoint SP manager receives SNMP requests, the community name is used to identify the associated SP.

   -or-

   If you selected *v3*, enter the username required for authentication, the authentication method, the authentication password, the encryption method and, optionally, the encryption password in the fields provided.
7. Click *Apply*.

To configure SNMP access settings for an SP:

Perform this procedure to configure how users on the public side authenticate themselves to the MergePoint SP manager.

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *SNMP*. The SNMP window appears.
4. In the Access settings area, click *Add*.
5. From the SNMP version drop-down menu, select a version.
6. If either the v1 or v2c version is selected in step 3, perform the following steps:
   a. In the Community field, type the public community name to be used by the external SNMP application.
   b. Select either *Default* or *Use IP* for the source.

NOTE: The Source field limits the IP address permitted to access the MergePoint SP manager through SNMP. If *Default* is selected, any IP address can access the appliance, but if *Use IP* is selected, only the specified IP address can access the appliance.

   c. If Use IP is selected, type a source IP address.
   d. Select an appropriate view for the Read and Write view settings. If the list is empty, no view has been configured; see *To configure views:* on page 64.

   -or-

   If the v3 version is selected in step 3, perform the following steps:

   a. Select a user from User drop-down menu. See *To configure users with SNMP v3:* on page 65 for more information.
   b. For each security level, select a read view and write view under the Read view and Write view columns. If the list is empty, no view has been configured; see *To configure views:* on page 64.
7. Click *Apply*.

NOTE: You may edit or delete an existing access setting by clicking the *Community/User* link and then following the on-screen instructions.

Example

The following example describes a typical flow of SNMP requests.

In an SNMP request to a SP from a client server, the SNMP request is issued to the MergePoint SP manager public IP address. The request contains the unique community name as defined in the SPs access settings section (see *To configure SNMP access settings for an SP:* on page 67). Once the request is received, the MergePoint SP manager initiates the same request to the SP using its own appliance IP address, which is either public or private depending on the network location of the SP, and using the community name as defined in the Service Processor SNMP setting window. (The community name must match the community name configured on the SP.) The SP must be configured with SNMP management applications pointing to the MergePoint SP manager's public or private IP address. When the response is received from the SP, the MergePoint SP manager sends it back to the client server using the appliance's public IP address and the community name as defined in the access settings for the SP.

Accessing a service processor's SNMP through the MergePoint SP manager

You can use third party utilities, such as "snmpwalk," to access a service processor's SNMP through the MergePoint SP manager. When using third party utilities, remember to add the context parameter (the service processor alias).

For example, you want to use the snmpwalk utility to access the SNMP of a MergePoint SP manager with an IP address of 172.26.25.99 and a community string of public158. The service processor alias is 172.26.25.158. To retrieve all SNMP information, enter the following command:

```
snmpwalk -v 1 -c public158 -n 172.26.25.158 172.26.25.99 .1.3.
```

The -n parameter is required prior to the service processor alias to specify which service processor you want to access.

NOTE: Visit www.net-snmp.org for more information about the snmpwalk utility.

SP Operations

NOTE: As noted throughout this section, the available features vary according to the types of service processors. For example, accessing system information is only available for IPMI, ILOM, HP IPMI, FTS iRMC, Dell iDRAC blade and Dell DRAC 5 devices; for other SPs, this feature cannot be viewed or accessed.

To perform any of these operations, access the MergePoint SP manager web interface. In the side navigation bar, click the name of the SP you wish to manage.

The following tabs are available:

- Properties: Use this tab to access system information and FRU, change the alias and copy or move the SP to a group. For a blade chassis that is managed as an SP, you can synchronize the blades with the SP.

- System: Use this tab to remotely perform system operations, including power, chassis and other advanced operations.
- Configuration: Use this tab to remotely configure managed SPs, including changing LAN parameters, managing user accounts, configuring PET settings, configuring SoL, setting BMC time, performing provisioning recovery and setting up SNMP and Native IP.
- SEL: Use this tab to view SP SEL information.
- Sensor: Use this tab to view the sensor output from managed target.
- System Sessions: Use this tab to activate and use SoL or the SP, Telnet, or SSH consoles for accessing managed SPs. You can also transparently access native TCP services on an SP through DirectCommand.
- Remote Control: Use this tab to connect to Remote Desktop Protocol (RDP) and Virtual Network Computing (VNC) servers.

Viewing SP information

To view the SP information:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.
3. In the top navigation bar, click *SP*. A window displaying SP information appears.

Synchronizing blades for a blade chassis

NOTE: The following procedure is only for SPs with blade chassis.

To synchronize the blades:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.
3. In the top navigation bar, click *SP*.
4. Click *Synchronize BladeCenter*. The blades on the side navigation bar are synchronized with the selected SP.

Changing the SoL port number

To change the SoL port number:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.
3. In the top navigation bar, click *SP*.

4. In the SoL Port field, type a SoL port number and click *Apply*.

Changing the access account of an SP

To change the access account of an SP:

1. Click the *SP* tab. The SP window appears.
2. In the Managed SP list, click the desired SP link.
3. In the Username and Password field, type the username and password you would like to use to access the SP.
4. Click *Apply*.

NOTE: For an unverified SP, you can select *Verify the username and password* to verify the SP with the username and password you enter.

Changing SP parameters

You can modify SP parameters, including username and password, verification status, SP profiles and SoL access.

To change SP parameters:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.
3. In the top navigation bar, click *SP*. A window displaying SP information appears.
4. Click *Edit*. The Edit SP window appears.
5. In the Alias field, type the new name for the SP.
6. For an unverified SP, if you want to require a username and password when connecting to the SP, select *Verify username and password*.
   a. To use the preset credentials configured by the manufacturer, deselect *Change username and password*.
      - or -
      To use a new username and password, select *Change username and password* and enter the username and password in the corresponding fields.
   b. Select or deselect *Data Buffering* as desired. (To set SoL data buffering size, see *Configuring the MergePoint SP Manager System Settings (Admin Users Only)* on page 46).

NOTE: If *Verify username and password* is selected, the username and password are verified when adding an SP and the Serial over LAN (SoL) session starts automatically. If *Verify username and password* is deselected, the username and password are not verified when adding an SP and the SoL session is not started.

For a verified SP, you may change the username and password in the corresponding fields for accessing other functions.

7. From the SP Profile drop-down menu, select the SP profile of the new SP.

NOTE: For more information on configuring SP profiles, see *Managing SP Profiles (Admin users only)* on page 41 and *Profile Configuration* on page 206.

8. From the SoL access type drop-down menu, select the SoL access type for the new iLO target device.

NOTE: This field only appears when you select *iLO* from the SP Profile drop-down menu.

9. Click *Apply*.

NOTE: For an SP with directcommnd-only SP profile, a username and password is not required. In this case, the username and password fields and SP verification fields are not shown.

To BMC self test an SP:

1. In the side navigation bar, click an SP name.
2. Click the *System* tab.
3. In the top navigation bar, click *Advanced Tools*. The Setting window appears.
4. Click *BMC Self Test* to perform a BMC self test on the selected SP. A message will appear to indicate the success status of the self test.

Accessing system information

The MergePoint SP manager can find and display certain system information for the selected SP, including device ID, firmware version, IPMI version and manufacturer ID.

To retrieve system information:

1. In the side navigation bar, click an SP name.
2. Click the *Properties* tab.
3. In the top navigation bar, click *Information*. A detailed system information report appears.

Recovering provisioning

You can recover the original provisioning based on the configuration already in place at the SP.

To recover provisioning for an SP:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Recover*. The Provisioning Recover window appears.
4. Click *Provisioning Recover*.

NOTE: The Provisioning Recover button is only available after the provisioning on this SP is performed successfully and confirmed.

Changing LAN parameters

To change LAN parameters:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *LAN*. The LAN window appears.
4. From the IP Address Source drop-down menu, select *Static* or *DHCP* as the source type. If you select *Static* as the source type, specify the SP's IP address, subnet mask and gateway IP address in the fields provided.

NOTE: If you select *DHCP*, the SP's IP address is dynamically distributed from a DHCP server and the fields for configuring a static IP cannot be edited.

5. Click *Apply*.

Host table

The host table is a simple text file that allows Admin user to associate IP addresses with hostnames and alias.

To change the host name of the MergePoint SP manager:

1. Select *Network - Host Table*.
2. Enter a host name for the MergePoint SP manager in the Name field.
3. Click *Apply*.

To add an entry:

1. Select *Network - Host Table*, then click *Add*.
2. Enter the required information in the fields provided, then click *Apply*.

To edit an entry:

1. Select *Network - Host Table.*
2. Click the IP address link of the entry you would like to edit and follow the on-screen instructions.

To delete an entry:

1. Select *Network - Host Table.*
2. Select the entry(s) you would like to delete and click *Delete*.

Static routes

Admin users can use the Static routes feature to manually add, edit or delete existing static routes.

To add a static route:

1. Click *Network - Static Routes.*
2. Click *Add.*
3. In the Network Address field, type a network IP address of the destination host or specify a network in the form networkIPaddress/mask_length (also referred to as prefix/length).
4. From the Type drop-down menu, select Interface or Gateway as you desire.
5. If you select Interface, then choose an interface from the Interface/Gateway drop-down menu.
   -or-
   If you select Gateway, then in the Interface/Gateway field, type the IP of the gateway.
6. In the Metric field, type the number of hops to the destination.
7. Click *Apply*.

NOTE: To set a default route, select *Network - Network Settings.*

To edit a static route:

1. Click *Network - Static Routes.*
2. Click the network address link of the static route you want to edit and follow the on-screen instructions.

To delete a static route:

1. Click *Network - Static Routes.*
2. Click the network address link of the static route you want to delete and click *Delete*.

Configuring SoL parameters

The MergePoint SP manager allows you to define SoL parameters for certain types of SPs, including Enable/Disable Serial over LAN, baud rate and channel privilege limit level.

To configure SoL parameters:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Serial over LAN*. The Serial over LAN Configuration window appears.
4. Specify any of the following information:
   a. Select or deselect *Enable Serial over LAN* as desired.
   b. From the Baud Rate drop-down menu, select the baud rate.
   c. From the Channel Privilege Level Limit drop-down menu, select *Administrator*, *Operator* or *User* as the privilege level.
   d. From the Retry Count drop-down menu, select the number of times for a retry to occur, from *0* to *7* times.
   e. In the Retry Interval field, enter the number of 10 milliseconds to elapse between each retry.
5. Click *Apply*.

NFS

Network File System (NFS) provides remote access to SoL history information across networks. By default, SoL history information is saved to the MergePoint SP manager. To free memory space on the MergePoint SP manager, you may configure the SoL history data to be saved to another network location and access the SoL directories from anywhere on the network.

To configure NFS storage of SoL history data (Admin users only):

1. Click *System - NFS*.
2. Select *Enable* and specify the following information:
   a. In the Server IP field, type the IP address of the NFS server.
   b. In the Mount Directory field, type the directory pathname exported from the NFS server.
   c. From the Protocol drop-down menu, select the mount protocol.
3. Click *Apply*.

Remote Control

You may connect to a Remote Desktop Protocol (RDP) or Virtual Network Computing (VNC) server remotely through the MergePoint SP manager.

To connect to an RDP server:

1. In the side navigation bar, click an SP name.
2. Click the *Remote Control* tab.
3. In the top navigation bar, click *RDP*. The RDP window appears.
4. In the Server field, type the host operating system IP address (or hostname).
5. Click *Connect*.

To connect to a VNC server:

1. In the side navigation bar, click an SP name.
2. Click the *Remote Control* tab.
3. In the top navigation bar, click *VNC*. The VNC window appears.
4. In the Server field, type the host operating system IP address (or hostname).
5. In the Port field, type the port of VNC server.
6. Click *Connect*.

Diagnostics

The Diagnostics tab provides network trace and debugging tools by collecting all IP packets from an exchange between a network interface of the MergePoint SP manager and an SP. Traced information is saved to a trace file that can be downloaded. If needed, the downloaded trace file can be sent to Avocent technical support for troubleshooting assistance.

This trace and debug tool is implemented by tcpdump (see http://www.tcpdump.org/ for more information). First set up the data collection parameters before starting the tracing process. When the debug stops, click the *Download* button to create a download link.

To start the network debug:

1. Click the Diagnostic tab.
2. In the top navigation bar, click *Debug*.
3. Configure the interface, protocol, source IP, source port destination IP and destination port filtering options as needed.

4. Click *Start*.

NOTE: You must stop the debug manually; otherwise the debug process continues indefinitely. When the trace file size reaches to the maximum size (preset maximum is 1M), the trace file will be rewritten.

To stop the network debug:

1. Click the Diagnostic tab.
2. In the top navigation bar, click *Debug*.
3. Click *Stop*. Once stopped, you may download the trace file.

To download the trace file:

1. Click the Diagnostic tab.
2. In the top navigation bar, click *Debug*.
3. Click *Download*. All trace data is compiled and a download link appears next to the Download button.
4. Click the *Download* link to save the trace file.

NOTE: The trace file is stored on the server until the next debug starts.

NOTE: Diagnostics may also be configured using the CLI utility. See the tcdump commands in *Summary of How to Configure the Top Level Parameters* on page 136.

Appliance Operations

MergePoint SP manager sessions

By selecting the *System - Sessions* option, the Admin user can view and manage MergePoint SP manager sessions and SSH/Telnet sessions.

Current MergePoint SP manager sessions are listed in the upper table of the session window.

To activate the session window and view a session:

Click *System - Session*. The current user session will be listed in green text.

To delete a session:

1. Click *System – Session*.
2. Select the session you wish to delete and click *Delete*.

Firmware version and upgrade

Visit www.avocent.com to download the latest MergePoint SP manager firmware files.

To upgrade firmware on the MergePoint SP manager (Admin users only):

1. Click *System - Upgrade*.
2. In the Filename field, type the path to the firmware file or click *Browse* to locate the file.
3. Click *Upgrade*.

NOTE: If the upgrade fails, you may use the serial port to restore the MergePoint SP manager to the previous firmware version. For more information see *Configuring the MergePoint SP Manager Basic Settings* on page 13.

To check the firmware version on the MergePoint SP manager (Admin users only):

1. Start an SSH session. See *Using SSH with the MergePoint SP Manager* on page 104.
2. Enter the **version** command. The version is displayed.

Example

```
root@MergePoint:~# version
MergePoint Application version:1.5.0.0
root@MergePoint:~# _
```

Boot configuration for the MergePoint SP5x24/SP5x40 manager

The Boot from drop-down menu lists options for booting the MergePoint SP manager. You can choose to use either the current image file or the image file stored on the network.

CAUTION: Network boots should be reserved only for troubleshooting.

Local boot options

In the Unit boot from drop-down menu, the entry for the current boot image is selected by default.

After a software upgrade, the boot file location choices are:

- Network
- Image:image_filename

The word “image” is followed by a colon (:), followed by the name of the file, including the version number. The menu item has the following format:

image: uImage.<version>-<build date>

Network boot options

For a network boot, the following prerequisites must be met.

- A TFTP server must be available to the MergePoint SP manager.
- An upgraded boot image file must be available on the boot server.

- The MergePoint SP manager must have a fixed IP address.

Configuring boot characteristics

The boot configuration feature allows the Admin user to configure the MergePoint SP5x24/SP5x40 manager boot characteristics, including the location of the MergePoint SP manager boot file, the watchdog timer state, the console speed and the speed of the Ethernet interfaces.

To configure boot options (Admin users only):

1. Click *System - Boot configuration*.
2. In the Appliance IP Address field, type the IP address for the MergePoint SP manager.
3. In the Watchdog Timer drop-down menu, select Active or Inactive option as you desire.

NOTE: If the watchdog timer is active, the MergePoint SP manager reboots if the software crashes.

4. In the Unit boot from drop-down menu, select the desired boot method.
5. To configure the unit boot from network:
   a. Enter the filename of the network boot program in the Network boot filename field.
   b. Enter the IP address of the TFTP server in the Server's IP address field.
   c. Select your desired console speed from the Console speed drop-down menu.

NOTE: The Network boot file must be in the /tftpboot directory on the TFTP server.

6. Select the desired speed for the eth0 and eth1 interfaces from the menus provided.
7. Click *Apply*.

NOTE: The system reboots automatically after you change the Unit boot file and apply it.

Unbinding the MergePoint SP manager from the DSView 3 server

To unbind the MergePoint SP manager from the DSView 3 server:

1. Click *System - Advanced Setting*.
2. Click *Unbind from DSView 3 Server*.

CHAPTER 4

SP Sessions and Connections

The MergePoint SP manager provides access to SPs through a variety of session types and connections. From an SoL (Serial over LAN), SP console, Telnet or SSH session, you can access the serial controller, access the console or perform management actions, respectively. Alternatively, DirectCommand sessions and Native IP sessions provide direct, transparent access to the native applications on the SP. The Sessions window allows you to start and manage all session types, with the exception of Native IP connections, which are available from the Network tab.

System Sessions

You may connect five types of sessions on an SP from the Sessions window: SoL sessions, SP console sessions, Telnet sessions, SSH sessions and DirectCommand sessions. When you connect an SoL session, SP console session, Telnet session or SSH session successfully, a corresponding window opens through a MindTerm client.

NOTE: Before using the MergePoint SP manager system sessions features, install the Java Runtime Environment (JRE) version 1.5.0_07 or later (1.5 series), or version 1.6.0_02 or later (1.6 series).

MindTerm client is a third party client that supports a variety of terminal emulation programs. Enter **<Ctrl> + <[mouse right-click]>** for the MindTerm menu. From the menu, you can configure terminal settings, define tunnels and modify other settings. For example, to change the terminal emulation program, select *Settings - Terminal - Terminal Type*. For more information on MindTerm client, see*Using MindTerm to Create an SSH Tunnel* on page 103

NOTE: Not all terminal emulation programs support function keys or special characters, so certain keystroke sequences may be required for some commands. For example, in some applications, the function key **F1** may be performed by entering **<Esc>1** on the keyboard. For more information, see the user guide for your terminal emulation program.

Session types

The following system session types are available:

- SoL (Serial over LAN) Session - SoL provides a mechanism that enables the serial controller of a managed SP to be redirected through a service processor session over IP. This enables remote console applications to provide access to text-based interfaces for BIOS, utilities, operating systems and management services while simultaneously providing access to service processor functions. See *SoL Sessions* on page 81.
- SP Console Session - This connection allows you to directly access the SP console. You can then launch the management application from the service processor's command line. See *SP Console Sessions* on page 82.
- Telnet Session - This connection uses the Telnet protocol to access the service processor's console and then perform SP management actions. After logging into the SP through the Telnet client, an admin user can send commands to the SP. See *Telnet Sessions* on page 82.
- SSH Session - This connection uses the SSH protocol to access the service processor's console and then perform SP management actions. After logging into the SP through the SSH client, an admin user can send commands to the SP. See *SSH Sessions* on page 83.
- DirectCommand Session - This connection is a unique session provided by the MergePoint SP manager. It allows transparent access to a service processor through the MergePoint SP manager's web interface. For more information, see *DirectCommand Sessions* on page 86. Native IP connections provide similar direct access functionality but are not operated through the Sessions window. For more information, see *Choosing DirectCommand Sessions or Native IP Connections* on page 83.

After selecting an SP and entering the Sessions window, all the supported sessions of the selected SP are displayed in different panels. There are two columns in each panel. The Action column lists the available actions for that session; click an action link to perform the corresponding action. The Status column shows the current state of the session. An "In-Use (N)" status (N=the number of connected sessions) indicates that the corresponding session is connected to the SP for the specified number of times, while the "Idle" status indicates that there is no connection to the corresponding session. A yellow icon is displayed next to an SP in the side navigation bar when there is at least one session connected with this SP.

The Active Session panel shows all the active sessions of the selected SP. You can disconnect a session by deleting it.

Active sessions

All currently active sessions are listed in the Active Session panel. Start time, duration, user, SP name and SP type session information is displayed. You can also disconnect active sessions from this window.

To view the Active Sessions panel and disconnect sessions:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the Active Sessions panel, select the session(s) you want to disconnect.
5. Click *Delete*. The corresponding session(s) window are closed.
   When all the connections to a session are deleted, the status of the corresponding session(s) is changed to *Idle*.

NOTE: You may also disconnect a session by closing the session window.

SoL Sessions

You may open an SoL session after setting up a serial over LAN connection.

NOTE: A maximum of four simultaneous sessions are allowed from the DRAC/MC Web-based remote access interface. For DRAC/MC SPs, only one SoL connection to one blade is allowed at a time.

NOTE: For HP BladeCenter SPs, firmware version v1.3 or later is required for SoL.

To start an SoL session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the SoL Session panel, click *SoL Session* to open the SoL window through a MindTerm client.

If the SP is a Windows server, an EMS/SAC prompt is returned. If the SP is a Linux server, the Linux serial console prompt is returned. Type valid SAC commands or Linux console commands in the MindTerm client to conduct SoL operations, such as BIOS configuration and power reset.

NOTE: For SoL sessions only, the **Ctrl+c** interrupt is inactive and will not pass through to the SP processor from a MindTerm screen.

NOTE: Certain SP processors output some history information by default during an SoL session. Be sure that any scripts written are expecting this extra information.

NOTE: For the information on the SoL configuration, see *Configuring SoL parameters* on page 74.

To view SoL session history:

1. In the side navigation bar, click an SP name.

2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the SoL Session panel, click *SoL Session History* to display all the commands entered in SoL mode and their output.

NOTE: Dell DRAC/MC SPs and iDRAC blade SPs do not support SoL session history.

NOTE: To save the SoL session history on the network file system, see *NFS* on page 74.

To replay SoL:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the SoL Session panel, click *SoL Sessions Replay* to replay SoL actions and results, including the BIOS result. Click and drag the speed bar to control replay speed.

SP Console Sessions

You can open an SP console session to the selected SP.

To start an SP console session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the SP Console Session panel, click *SP Console Session* to open the SP console window through a MindTerm client. After connecting to the service processor console session, you can run any corresponding service processor console commands.

Telnet Sessions

You can open a Telnet session to the selected SP.

To start a Telnet session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.

4. In the Telnet Session panel, click *Telnet Session* to open the Telnet console window through a MindTerm client.

After connecting to the Telnet session and logging into the SP with SP's username and password, you can launch the management application from the service processor's command line.

SSH Sessions

You can open an SSH session to the selected SP.

To connect SSH session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the SSH Session panel, click *SSH Session* to open the SSH console window.

After connecting to the SSH session and logging into the SP with SP's username and password, you can launch the management application from the service processor's command line.

Choosing DirectCommand Sessions or Native IP Connections

You can connect directly to native applications on the SP through either DirectCommand sessions or Native IP connections. These applications are proprietary interfaces or command lines provided by the service processor vendor; examples include HP InSight, IBM Director and Dell Open Manage®.

With DirectCommand, users can gain access to native applications, integrated web servers and other proprietary interfaces that are available over TCP/IP. You can use the MergePoint web interface to launch a browser, vKVM or virtual media (vMedia) session on a service processor. DirectCommand only provides native access to pre-defined TCP ports on a service processor through a mapped local address.

Alternatively, Native IP (MergePoint SP5x24/SP5x40 manager only) allows access to native applications using the native IP address of the service processor. Once enabled and configured, Native IP allows external user traffic to selectively pass through the MergePoint SP5x24/SP5x40 manager and directly connect to a service processor on the internal server network. To configure Native IP, enable Selective mode, which creates an open trust, or define Native IP trusts with specific IP addresses that are permitted to establish Native IP connections.

Examples of cases where Native IP should be used instead of DirectCommand:

- If you want an application like HP Systems Insight Manager (SIM) or IBM Director to connect to the native IP address of a service processor connected to the MergePoint SP5x24/SP5x40 manager, use Native IP. The Native IP feature allows access to the related programmatic interface and network protocols, where as DirectCommand only allows interaction with the configured TCP ports of a service processor through a mapped local loopback address (such as 127.x.x.x).
- If you want to expose SNMP traps coming from a service processor to an SNMP trap agent on the user network, so that they can be collected directly by the SNMP agent, use Native IP. This applies to any other network protocol that needs to selectively pass to/from the service processor, through the MergePoint SP5x24/SP5x40 manager, and to/from trusted hosts in the user network. Another example of this type of protocol is Active Directory (AD), which may be needed if you want to authenticate iLOs with AD credentials instead of with local credentials.
- If you want to provide direct user access to a service processor that has hard-coded IP addresses, use Native IP. (DirectCommand would automatically translate the hard-coded IP address to a local loopback address, which would prevent a successful connection).

The following figure illustrates a DirectCommand or Native IP connection to an SP.

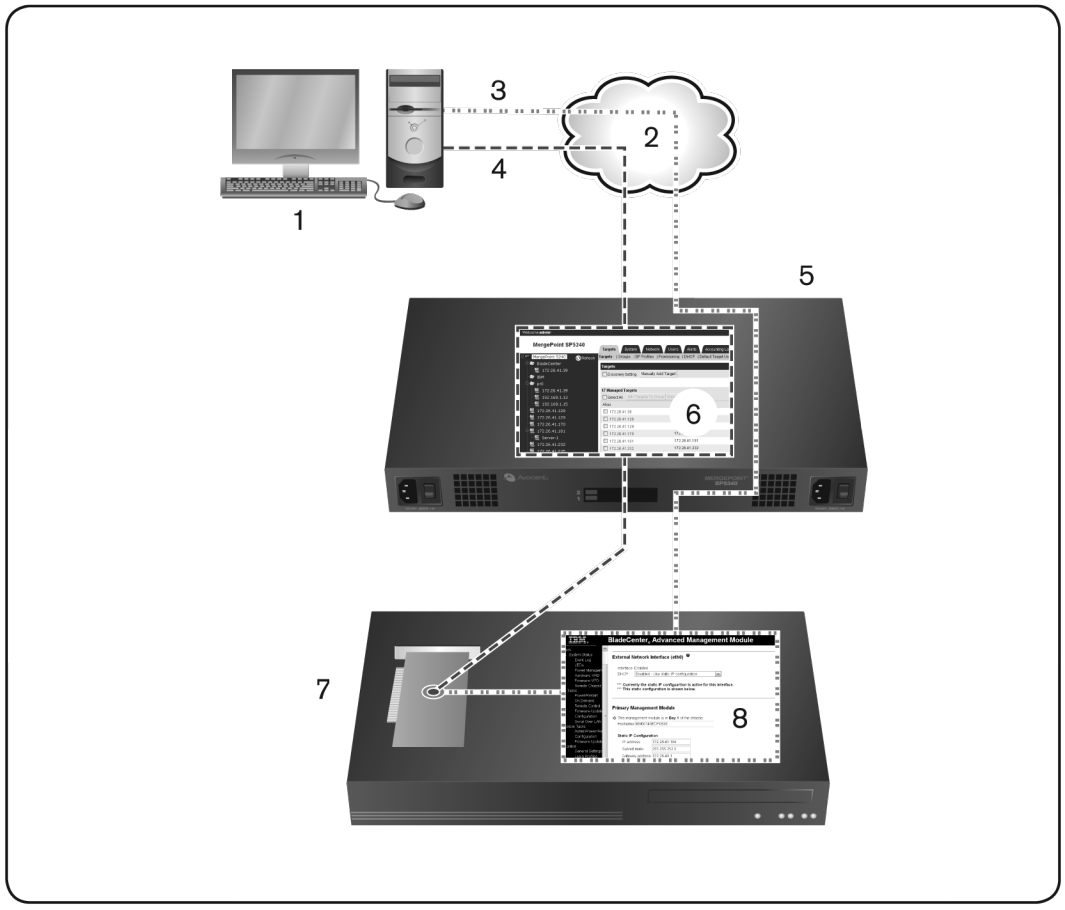

Figure 4.1: MergePoint SP5x24/SP5x40 SP Manager Native IP Configuration

Table 4.1: Descriptions for MergePoint 24/40 SP Manager Native IP Configuration

Number	Description	Number	Description
1	Remote user	**5**	MergePoint SP5x24/SP5x40 manager
2	LAN	**6**	MergePoint SP manager web interface

Number	Description	Number	Description
3	DirectCommand or Native IP connection to the service processor	7	SP
4	Connection to the MergePoint SP manager web interface	8	Native interface, application or command line on the SP

DirectCommand Sessions

DirectCommand sessions allows transparent access to a service processor through the MergePoint SP manager's web interface. The DirectCommand Auto Login feature provides a configurable option to log in automatically to the remote SP management web interface without needing to enter a username or password. The vKVM interface or vMedia interface allows you to launch a vKVM or vMedia session on the SP.

NOTE: DirectCommand requires Java SE Runtime Environment version 1.6.0_02 or later. Visit www.sun.com to download the Java SE Runtime Environment.

A DirectCommand connection builds a set of TCP port forwarding tunnels between a user's workstation and a service processor managed by the MergePoint SP manager. All TCP packets that arrive at the user's workstation are forwarded directly to the service processor. The detailed information for the tunnels can be viewed from the DirectCommmand connection list window.

To use DirectCommand, first set up a DirectCommand connection between the user's workstation and the service processor to be accessed. Second, use the Browser Session, vKVM interface or vMedia interface provided by the DirectCommand connection.

NOTE: When you launch a DirectCommand session to a BladeCenter SP, you cannot access the corresponding blades from the session. However, if a blade server has the ability to communicate with the MergePoint SP manager and was added as an independent SP, you can launch a separate DirectCommand session to that blade server. To add a blade server to the appliance, see *Adding blade chassis and blades* on page 37.

To start a DirectCommand session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the DirectCommand Session panel, click *Connect*.

If the connection is successful, session links will appear below the connection status. From these links you can go to the Browser Session interface, Browser Session (Auto Login)

interface, vKVM interface or vMedia interface. A DirectCommand Connected link appears on the top option bar on the upper-right side of the page, where you can access the DirectCommand connection list window.

If the connection fails, the related diagnostic information and error message is shown.

NOTE: The number of session links depends on the type of SP. For example, currently only iLO has the vMedia interface. Most SPs support the Browser Session (Auto Login) interface and the vKVM interface.

NOTE: For RSA-II SPs, the vKVM session interface and vMedia session interface are in the same window.

CAUTION: For proper operation, the vKVM port for RSAII device should be TCP port 2000.

DirectCommand connection list

When you select an SP and successfully connect DirectCommand, a DirectCommand Connected link appears on the top option bar on the upper-right side of the page. Clicking this link displays the DirectCommand connection list showing all currently active DirectCommand connections. From this window you can access Browser session interface, Browser session Auto Login interface, vKVM interface or vMedia interface of a connected SP by selecting the SP and clicking the corresponding button. You may also view the device connection information and forwarded ports from this window.

NOTE: The forwarded port information is retrieved from the TCP ports table in the SP profile. See *DirectCommand Options* in *Managing SP Profiles (Admin users only)* on page 41.

To open the DirectCommand connection list window:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the DirectCommand Session panel, click *Connect*.
5. From the Top Option bar, click *Connected*. The DirectCommand connection list window appears.
6. The list displays all currently active DirectCommand connections with the corresponding SP IP addresses.

To start a Browser session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.

4. If DirectCommand is not already connected, click *Connect* in the DirectCommand Session panel.
5. Click *Browser Session*.

   -or-

   From the Top Option bar, click *Connected*. The DirectCommand connection list window appears. Select the alias of the desired SP from the window, then click *DirectCommand*.

To start a Browser session (Auto Login):

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. If DirectCommand is not already connected, click *Connect* in the DirectCommand Session panel.
5. Click *Browser Session* (Auto Login).

   -or-

   From the Top Option bar, click *Connected*. Select the alias of the desired SP, then click *Browser Session*.

To start a vKVM session:

NOTE: Close any other open network applications, such as VNC, to avoid a port number conflict.

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. If DirectCommand is not already connected, click *Connect* in the DirectCommand Session panel.
5. Click the *vKVM Session* link.

   -or-

   From the Top Option bar, click *Connected*. Select the alias of the desired SP, then click v*KVM Session*.

NOTE: If a vKM session is opened to an iLO or iLO 2 SP through DirectCommand, another vKVM session cannot be started and the current vKVM session cannot be shared.

NOTE: Some versions of the RSA II SP firmware can become unstable when two or more web or vKVM sessions are opened simultaneously. If you open these sessions directly from the RSA II SP without going through the MergePoint SP manager, the web browser displays a blank page. If you open the Browser or vKVM session from the MergePoint SP manager DirectCommand session panel, *SP unavailable* and *Reset firmware* messages are displayed.

To start a vMedia session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. If DirectCommand is not already connected, click *Connect* in the DirectCommand Session panel.
5. Click *vMedia Session*.

   -or-

   In the Top Option bar, click *Connected*. Select the alias of the desired SP, then click *vMedia Session*.

To disconnect a DirectCommand session:

1. In the side navigation bar, click an SP name.
2. Click the *System Sessions* tab.
3. In the top navigation bar, click *Sessions*.
4. In the Top Option bar, click *Connected*. Select the alias of the desired SP, then click *Disconnect*. Or, click *Disconnect All* to close all DirectCommand sessions at once.

   -or-

   Delete DirectCommand session(s) from the Active Session panel. For detailed information, see *Active sessions* on page 80.

NOTE: If you update the SP firmware to a version newer than the one supported by the appliance, the DirectCommand Browser sessions with Auto Login or vKVM sessions may not be available.

NOTE: When launching a session via DirectCommand, the SP may return unexpected results due to service processor instability. If this occurs, reset the service processor by connecting to the service processor console from the *System Sessions - SP Session* menu and running the reset service processor command. The reset service processor command varies for each SP profile; for example, for RSAII devices, the reset service processor command is **resetsp**. See *SP Console Sessions* on page 82 and *Profile Configuration* on page 206.

Native IP Connections

NOTE: Native IP is supported on the MergePoint SP5x24/SP5x40 manager only.

The Native IP configuration process includes these steps:

- To allow any IP addresses on the network to create Native IP connections, administrators can enable Selective mode. Selective mode creates an open trust (0.0.0.0/0) that frees the connection pathway to trust any client to make a Native IP connection.

  -or-

  To limit which IP address can create Native IP connections, administrators can specify IP addresses in a Native IP trust. The IP addresses within the trusts are permitted to create Native IP connections to some or all service processors.

- Administrators set up Native IP connections, which are permanent outbound connections that allow service processors to directly connect to specific trusted IP addresses. If Selective mode is not enabled, each IP address should be included in at least one Native IP trust.

  Additionally, users with appropriate access rights may establish temporary, individual IP trusts from their workstations to a specific service processor. Temporary trusts are automatically disabled once the web session ends.

- Add a route or set the MergePoint SP manager IP address as the default gateway for the host.

Native IP operations using the web interface

To enable Selective mode (to trust all clients):

1. In the side navigation bar, select the MergePoint SP manager.
2. Click *Network - Native IP Connects*.
3. The Selective Mode status is displayed. Click *Start*.

To create Native IP trusts (to specify which clients are trusted):

1. In the side navigation bar, select the MergePoint SP manager.
2. Click *Network - Native IP Trusts*.
3. Click *Add*.
4. In the IP field, enter a range of trusted IP addresses.

NOTE: The Native IP trust address should be the address of the subnet itself, which means all of the host bits of the address are 0 (zero).

5. Enter a subnet mask and select an interface for the Native IP.
6. Click *Apply*.

To delete a Native IP trust:

1. In the side navigation bar, select the MergePoint SP manager.
2. Click *Network - Native IP Trusts*.
3. Select the Native IP you want to delete and click *Delete*.

NOTE: When a trust is deleted, any related Native IP connections are disabled.

To set up a permanent Native IP connection:

1. In the side navigation bar, select the MergePoint SP manager.
2. Click *Network - Native IP Connects*.
3. Click *Add*.
4. In the Client IP field, type a host IP address.
5. In the SP drop-down menu, select a service processor IP address.
6. Click *Apply*.

NOTE: The client IP address must be within a range of the Native IP trust. You must enable the Native IP connection in the service processor or create a permanent Native IP connection in the Native IP Connection tab.

To delete a permanent Native IP connection:

1. In the side navigation bar, select the MergePoint SP manager.
2. Click *Network - Native IP Connects*.
3. Select a Native IP connection.
4. Click *Delete*.

To enable or disable a temporary Native IP connection for a service processor:

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Native IP*. The Native IP window appears.
4. Click *Enable/Disable* to enable or disable Native IP.

NOTE: If the specified range of SP IP addresses is not included in a Native IP trust, the Native IP status is displayed as Unavailable and a temporary connection cannot be created.

NOTE: A Native IP connection must be set up on a trusted network interface (specified when creating a Native IP trust).

To add a route or set the appliance as a default gateway at the user's workstation:

NOTE: This procedure is provided for your convenience, but specific steps may vary depending on the host operating system. For more information, see the installer/user guide for the host operating system.

Open the Internet Protocol (TCP/IP) Properties window and enter the MergePoint SP manager IP address in the default gateway field.

-or-

Add a route by entering the appropriate command for your operating system; for example:

```
C:\Documents and Settings\admin>route add 192.168.1.20 mask
255.255.255.255 172.26.26.23
```

To directly connect to a native interface on a service processor:

NOTE: Before accessing the native interface, make sure you have already added a route or set the appliance as the default gateway for the host.

1. In the side navigation bar, click an SP name.
2. Click the *Configuration* tab.
3. In the top navigation bar, click *Native IP*, then click *Go to native IP interface*.

NOTE: The Go to native IP interface option is not visible if Native IP is not enabled.

Native IP operations using SSH Commands

Admin users can create Native IP trusts and open Native IP connections with SSH commands. Admin users can specify what IP addresses from which interfaces are trusted to bring up direct connection to service processors.

To login to the MergePoint SP manager console as admin user:

You may log in to the MergePoint SP manager with any of the SSH clients, such as PuTTY tool, SecureCRT tool or OpenSSH client. The following command examples use the OpenSSH client under a Linux terminal.

Run the command by entering the following:

```
admin@MergePoint:~$ ssh -t username@MergePoint_IP_or_DNS_name
```

For example:

```
admin@MergePoint:~$ ssh -t admin@172.26.25.173
```

To enable selective mode:

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl truston 0.0.0.0/0.0.0.0
```

To add a Native IP trust:

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl truston <native_IP_Trust>/<netmask> dev
<interface>
```

For example, to allow direct connection from 172.X.X.X network segment to service processors:

```
admin@MergePoint:~$ nativeipctl truston 172.0.0.0/255.0.0.0 dev eth0
```

For example, to allow direct connection from host 192.168.0.1 to service processors:

```
admin@MergePoint:~$ nativeipctl truston 192.168.0.1/255.255.255.255 dev
eth0
```

NOTE: The parameter dev defines the interface that all the connections should go through. If the interface is eth0, then only the connections through eth0 are allowed to be set up.

To list all the available trusts by command:

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl list trusts
```

To enable Native IP connections (temporarily):

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl on client <host ip address> <device IP
address>
```

For example, to enable temporarily direct access from 172.26.27.15 to 172.26.25.160:

```
admin@MergePoint:~$ nativeipctl on client 172.26.27.15 172.26.25.160
```

To disable Native IP connections (temporarily):

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl off type t client <host ip address>
<device IP address>
```

To enable Native IP connections (permanently):

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl on type p client <host ip address>
<device IP address>
```

For example, to enable permanently direct access from 12.23.56.78 to 172.26.25.157:

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl on type p client 12.34.56.78
172.26.25.157
```

To disable Native IP connections (permanently):

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl off type p client <host ip address>
<device IP address>
```

To list all the available Native IP connections:

Run the command by entering the following:

```
admin@MergePoint:~$ nativeipctl list connections
```

CHAPTER 5

Configuring External Authentication Services

By selecting the *Users – Authentication Services* menu option, the administrative user can configure authentication services. These authentication methods use both local authentication and authentication servers in the order shown: Local/AuthType, AuthType/Local and then AuthType Down/Local.

- The AuthType/Local and AuthType Down/Local authorization methods are referred to as authentication methods with local fallback options.
- Administrators can specify separate authentication types for the MergePoint SP manager user accounts.
- Local authentication methods and the authentication methods that have local fallback options require user accounts configured on the MergePoint SP manager.

If configuring any authentication method other than Local, the administrator user must make sure an authentication server is set up for that method as itemized in the following list.

- The appliance must have network access to an authentication server set up for every authentication method specified.
- Each authentication server must be configured and operational.
- The administrator configuring the appliance needs to work with the administrator of each authentication server to get user accounts set up and to obtain information needed for configuring access to the authentication server on the appliance.

The following table lists the supported authentication methods and their definitions.

Table 5.1: Supported Authentication Methods

Method	Definition
Local	Use local user/password for local authentication on the MergePoint SP manager.

Method	Definition
AuthType	Use user/password configured on the AuthType authentication server. No logins allowed if the AuthType server is down or the AuthType authentication fails.
AuthType Down/Local	Use local authentication if the AuthType server is down.
AuthType/Local	Use local authentication if the AuthType authentication fails.
Local/AuthType	Use the AuthType authentication if local authentication fails.

NOTE: The AuthType is Kerberos, LDAP, NIS, RADIUS, SMB, TACACS+ or DSView 3. For the DSView 3 authentication method, the MergePoint SP manager must be managed by the DSView 3 management software; otherwise, the DSView 3 authentication will fail.

The default authentication service type is Kerberos. If any other authentication method is selected, additional fields appear on the screen for specifying the information for an authentication service of the selected method.

When the administrative user configures an authentication server on this page, the server is available to perform authentication checking for logins to the MergePoint SP manager, if the MergePoint SP manager is subsequently configured to use that authentication method. See *Configuring an Authentication Method for the MergePoint SP Manager* on page 100 for how the MergePoint SP manager is assigned an authentication method.

Configuring a Kerberos Authentication Server

You need to configure a Kerberos authentication server when the MergePoint SP manager is configured to use the Kerberos authentication method or any of its variations (Kerberos, Local/Kerberos, Kerberos/Local or Kerberos Down/Local).

If the Kerberos authentication server (which is also referred to as a Key Distribution Center, or KDC) has previously been configured in either of the authentication configuration screens, the fields are filled in with the previously configured values.

NOTE: The Kerberos KDC rejects tickets when the timestamp on an authentication request from a host is not within the maximum clock skew time specified in the KDC's hdc.conf file. Therefore, it is essential for the time on the MergePoint SP manager to be synchronized with the time on the KDC.

To configure a Kerberos authentication server:

1. Make sure entries for the appliance and the Kerberos server exist in the MergePoint SP manager's /etc/hosts file.
   a. Select the *Network* - *Host Table* menu option. The Host Table form appears.

b. Add an entry for appliance (if needed) and add an entry for the Kerberos server.

2. Make sure that time zone and time and date settings are synchronized between the MergePoint SP manager and on the Kerberos server.

NOTE: Kerberos authentication depends on time synchronization. Time and date synchronization is most easily achieved by setting both the MergePoint SP manager and the Kerberos server to use the same NTP server.

a. Follow the procedure to set the time zone, date and time.

b. Work with the authentication server's administrator to synchronize the time and date between the MergePoint SP manager and the server.

3. Click the *Users* tab.
4. In the top navigation bar, click *Authentication Services*. The Authentication Service Configuration window appears.
5. Select *Kerberos* from the Authentication Method drop-down menu. The Kerberos configuration fields display.
6. In the Kerberos Realm Domain Name field, type the domain name of the Kerberos.
7. In the Kerberos Server field, type the IP address of the Kerberos server.
8. Click *Apply*.

Configuring an LDAP Authentication Server

You need to configure a LDAP authentication server when the MergePoint SP manager is configured to use the LDAP authentication method or any of its variations (Local/LDAP, LDAP/Local or LDAP Down Local). See *Configuring group authorization for LDAP authentication* on page 113 for how to manually configure group authorizations with LDAP authentication.

To configure an LDAP authentication server:

1. Click the *Users* tab.
2. In the top navigation bar, click *Authentication Services*. The Authentication Service Configuration window appears.
3. Select *LDAP* from the Authentication Method drop-down menu. The LDAP form displays with LDAP Server and LDAP Base fields filled in from the current values in the /etc/ldap.conf file.
4. In the LDAP Server field, type the IP address of the LDAP server.

5. In the LDAP Base field, change the definition if the LDAP authentication server uses a different distinguished name for the search base than the one displayed.

NOTE: The default distinguished name is dc, as in dc=value,dc=value. For example, if the distinguished name on the LDAP server is o, then replace dc in the base field with o, as in o=value,o=value.

6. From the Secure LDAP drop-down menu, select either *Off*, *On* and *Start TLS*.
7. In the LDAP User Name field, type an optional username.
8. In the LDAP Password field, type an optional password.
9. In the LDAP Login Attribute field, type an optional login attribute.
10. Click *Apply*. The changes are stored in /etc/ldap.conf on the MergePoint SP manager.

Configuring an NIS Authentication Server

You need to configure an NIS authentication server when the MergePoint SP manager is configured to use the NIS authentication method or any of its variations (NIS/DownLocal, Local/NIS or NIS/Local).

To configure an NIS authentication server:

1. Click the *Users* tab.
2. In the top navigation bar, click *Authentication Services*. The Authentication Service Configuration window appears.
3. Select *NIS* from the Authentication Method drop-down menu. The NIS fields display.
4. In the NIS Domain Name field, type the NIS domain name.
5. In the NIS Server IP field, type the IP address of the NIS server.
6. Click *Apply*.

Configuring a RADIUS Authentication Server

You need to configure a RADIUS authentication server when the MergePoint SP manager is configured to use the RADIUS authentication method or any of its variations (Local/Radius, Radius/Local or Radius Down/Local). See *Configuring group authorization for RADIUS authentication* on page 116 for how to manually configure group authorizations with RADIUS authentication.

To configure a RADIUS authentication server:

1. Click the *Users* tab.

2. In the top navigation bar, click *Authentication Services*. The Authentication Service Configuration window appears.
3. Select *Radius* from the Authentication Method drop-down menu.
4. In the First Authentication Server field, type the IP address of the first or only authentication server.
5. In the Second Authentication Server field, type the IP address of a second authentication server (if available)
6. In the First Accounting Server field, type the IP address of the first or only accounting server.
7. In the Second Accounting Server field, type the IP address of a second accounting server (if available)
8. In the Secret field, type the secret.
9. In the Timeout field, type one or more time-out values.
10. In the Retries field, type a number of retries.
11. Click *Apply*.

Configuring an SMB Authentication Server

You need to configure an SMB authentication server when the MergePoint SP manager is to use the SMB authentication method or any of its variations (Local/SMB, SMB/Local or SMB Down/Local).

To configure an SMB authentication server:

1. Click the *Users* tab.
2. In the top navigation bar, click *Authentication Services*. The Authentication Service Configuration window appears.
3. Select *SMB* from the Authentication Method drop-down menu.
4. In the Domain field, type the SMB domain name.
5. In the Primary Domain Controller field, type the IP address of the primary domain controller.
6. In the Secondary Domain Controller field, type the IP address of the secondary domain controller.
7. Click *Apply*.

Configuring a TACACS+ Authentication Server

You need to configure a TACACS+ authentication server when the MergePoint SP manager is to use the TACACS+ authentication method or any of its variations (Local/TACACS+, TACACS+/Local or TACACS+ Down/Local). To configure a TACACS+ authentication server, you must prepare an account for admin or other admin user.

To configure a TACACS+ authentication server:

1. Click the *Users* tab.
2. In the top navigation bar, click *Authentication Services*. The Authentication Service Configuration window appears.
3. Select *TACACS+* from the Authentication Method drop-down menu.
4. In the First Authentication Server field, type the IP address of the first authentication server.
5. In the Second Authentication Server field, type the IP address of a second authentication server.
6. In the First Accounting Server field, type the IP address of the first accounting server.
7. In the Second Accounting Server field, type the IP address of the second accounting server.
8. In the Secret field, type the secret.
9. Check the *Enable Raccess Authorization* checkbox.
10. In the Timeout field, type one or more time-out values.
11. In the Retries field, type a number of retries.
12. Click *Apply*.

Configuring an Authentication Method for the MergePoint SP Manager

By selecting the Users-Authentication menu option, the administrative user can configure the authentication method that applies when anyone attempts to log into the MergePoint SP manager.

By default, Local authentication is in effect and no configuration is required.

The specified type of authentication server must be available and must be configured as described under *Configuring Groups for Use with Authentication Servers* on page 112.

To configure an authentication method for MergePoint SP manager logins:

1. Click the *Users* tab.

2. In the top navigation bar, click *Authentication*. The Authentication Configuration window appears.
3. Select the desired authentication method from the Authentication Method drop-down menu.
4. Click *Apply*.

CHAPTER 6

Administration Tasks Not Performed in the Web Interface

This section lists the configuration and maintenance tasks that are performed by an administrator (the root user, the admin user or a member of the admin group) on the Linux command line, using the CLI utility.

Using MindTerm to Create an SSH Tunnel

This section describes how an admin user can create an SSH tunnel from a user workstation to a managed device using the MindTerm applet that activates when any user connects to the console using the web interface. A regular user cannot use this procedure; the Tunnels option is not available for them on the MindTerm menu.

NOTE: You must enable the SSH protocol before creating an SSH tunnel. See *Configuring the MergePoint SP Manager System Settings (Admin Users Only)* on page 46.

To use MindTerm to create an SSH tunnel:

1. Connect any of the following sessions: SoL session, SP console session, Telnet session or SSH session to an SP, or create an SSH connection to the MergePoint SP manager. A window running a MindTerm applet appears, with an encrypted SSH connection between the user's computer and the console.
2. Log in and follow any prompts that may appear about saving the host key.
3. Press **Ctrl** and the right mouse button at the same time (**Ctrl**+[mouse right-click]) then drag the cursor to pull down and select the *Tunnels Setup...* menu option. The MindTerm Basic Tunnel Setup dialog box appears.
4. Click *Add...* The Add tunnel dialog box appears.
5. Select the Type as *Local*.
6. Enter a TCP port number to forward in the Bind port field. You can select a random number over 1000.

7. Enter the device's port number to bring up the desired web application in the Dest. port field.
8. Enter the IP address of the device in the Dest. address field.
9. Click *OK*. The tunnel is created.

Using SSH with the MergePoint SP Manager

Both SSH v1 and SSH v2 services are supported on the MergePoint SP manager. The administrator may disable either version; if only one version of SSH is enabled, authorized users can use only a client running the same version.

If SSH is enabled, authorized users can use SSH in the following ways:

- Accessing the MergePoint SP manager console using an SSH client or SSH command, then connecting through the MergePoint SP manager to perform device management actions. See *User shell* on page 105 and *MgpShell* on page 106.
- Using the SSH command with special device management commands to perform device management actions without having to log into the MergePoint SP manager first. See *SSH Passthrough commands* on page 106.

To create an SSH connection:

1. Click *System - Setting*.
2. Click *Connect*. This connection uses the SSH protocol and opens in a separate window.

NOTE: See *Using MindTerm to Create an SSH Tunnel* on page 103 for more information.

The SSH command line format

The general format of the SSH command line is shown in the following example:

```
admin@MergePoint:~$ ssh -t username:[devicename]@MergePoint_IP_or_DNS_
name
```

In this example, the -t option is required to launch an interactive session. The username is the account name of the authorized user. The device name is the name/alias that was assigned to the device by the MergePoint SP manager administrator (used only when accessing a device).

```
To access the MergePoint SP manager console, omit the device name:
admin@MergePoint:~$ ssh -t admin:@MergePoint_IP_or_DNS_name
```

The MergePoint_IP_or_DNS_name is the IP address of the MergePoint SP manager or its DNS name. The command is one of the MergePoint SP manager specific device management commands described in the SSH Passthrough table.

User shell

After logging in the MergePoint SP manager console via SSH command or SSH applications (such as PuTTY or Telnet) non-admin users see a menu like the one shown in the following example.

```
Access Devices
Change Password
Logout
```

Admin users can get to the same menu either by entering the **rmenush** command on the SSH command line or by entering **/usr/bin/rmenush** on the command line after login. You can move from one item to another on the menu and submenus by using the keyboard arrow keys. A line (-) appears next to the selected item.

When Access Devices is selected, a menu appears with a list of devices that the user is authorized to access. After a device is selected, pressing the **Enter** or **Return** key brings up the list of actions the user is authorized to perform on the device.

Not all listed actions are supported for all service processors. The following example shows the service processor action menu for an HP iLO/iLO2 service processor.

```
HP iLO/iLO2
Access the service processor's console
Access the device's console via SoL
Manage power
Reset SP
Manage the event log
View sensor output
Start Telnet session
Start SSH session
Enable native IP
Disable native IP
Exit
Back
```

NOTE: If you select *Start Telnet session* or *Start SSH session*, you are prompted for the corresponding port, and then required to enter the username and password.

NOTE: The Enable native IP and Disable native IP commands are only supported on the MergePoint SP5x24/SP5x40 manager.

MgpShell

After logging in MergePoint SP manager console via SSH command or SSH applications as an admin user, typing **mgpshell** and pressing the **Enter** or **Return** key brings up a list of devices you are authorized to access, as shown in the following example.

```
Select a device
IBM Blade Center
HP Blade System
HP iLO/iLO2
Exit
```

After a device is selected, a submenu lists the device management actions available to the user. See *User shell* on page 105 for details.

SSH Passthrough

SSH Passthrough allows you to perform management operations on SPs without having to log into the MergePoint SP manager first. You may establish an SSH connection to an SP by specifying the appropriate name in the SSH command. When opening an SSH passthrough connection to a supported device, you may include an service processor command at the end of the SSH command. If the service processor command is not present at the end of the SSH command, the MergePoint SP manager will provide the user with a menu of service processor commands to choose from.

SSH Passthrough commands

There are two types of SSH commands: commands without an service processor command and commands with an service processor command.

To access an SP through SSH Passthrough:

Run the command by entering the following: ssh –t userA:serverB@applianceC.

NOTE: In this example, a user (userA) is trying to access an SP (serverB) that is connected to a MergePoint SP manager (applianceC).

This command allows the user to get access to serverB's service processor. A menu appears after successfully logging in. The user can manage serverB by choosing a menu item.

To access an SP through SSH Passthrough with service processor command:

Run the command by entering the following: ssh –t userA:serverB@applianceC [command].

NOTE: In this example, a user (userA) is trying to access the service processor feature [command] on an SP (serverB) that is connected to a MergePoint SP manager (applianceC).

The first part of the command will establish an SSH session to the MergePoint SP manager. The command is passed through to the service processor connected to the MergePoint SP manager. The MergePoint SP manager will validate and execute the command.

For example, a command to open an SSH session to the MergePoint SP manager and execute power on command may look like this:

```
ssh –t jsmith:MGP@172.30.19.122 poweron
```

Table 6.1: Supported Service Processor Commands

Command Name	Description
clearsel	Clears the SP SEL.
devconsole	Opens SoL for the SP.
nativeipoff	Revokes direct access to the service processor. **NOTE:** This command is only supported on the MergePoint SP5x24/SP5x40 manager.
nativeipon	Configures the appliance to allow direct access to the service processor. **NOTE:** This command is only supported on the MergePoint SP5x24/SP5x40 manager.
powercycle	Turns off a target device that is turned on, then after 10 seconds turns it on again.
poweroff	Turns the target device off.
poweron	Turns the target device on.
powerstatus	Shows the power status of the target device.
reset	Restarts a target device that is turned on.
sel	Views the SP SEL.
sensors	Views the sensor status of a target device.
solhistory	Displays the history of the console on the managed server.
solreplay	Replays the history of the console on the managed server.
spconsole	Accesses the command line on the service processor.
spconsole <action>	Executes the specified action on the service processor, then exits.

Command Name	Description
ssh	Starts an SSH session on the server.
telnet	Starts a Telnet session on the server.

Telnet

You can start or stop the Telnet service at any time.

To start or stop Telnet service:

1. Log into the MergePoint SP manager console as **root**.
2. Edit the Telnet file using the following command:

   ```
   root@Mergepoint:~# vi /etc/xinetd.d/telnet
   ```

3. Set the value of "disable" to "yes" or “no” to disable or enable the Telnet service.
4. Quit vi and run the following command to apply the setting and restart the Telnet service.

   ```
   root@Mergepoint:~# /etc/init.d/xinetd restart
   ```

NOTE: You can also enable or disable Telnet in the System - Settings window in the web interface. See *Configuring the MergePoint SP Manager System Settings (Admin Users Only)* on page 46.

Displaying the MergePoint SP Manager Firmware Version

To display the firmware version:

1. Open an SSH session. (See *Using SSH with the MergePoint SP Manager* on page 104).
2. Enter the following command.

   ```
   root@MergePoint:~# version
   ```

3. The current firmware version is returned.

Configuring the Users’ Console Login Menu

Regular users are configured with /usr/bin/rmenush as their default login shell. All users with rmenush as their login shell see the same menu whenever they log into the console.

The MergePoint SP manager administrator can configure the rmenush menu to display other options including links to additional submenus or commands by modifying the /etc/menu.ini file.

NOTE: If changing the default menu, the administrator must ensure that any added programs do not introduce security vulnerabilities.

The administrator must know the following about the behavior of rmenush before configuring any changes to the menu:

- If the called program exits with a return code indicating an error, rmenush prompts the user to press any key to continue.
- Any error messages generated by the called program are left on the screen for the user to read. Examples showing how the administrator can force this behavior on for successful programs and off for unsuccessful ones are provided in the configuration file.
- The MergePoint SP manager administrator assigns the /usr/bin/rmenush shell to users as appropriate, by editing the /etc/passwd file entries for the users.

When editing the menu.ini file, the administrator must know the following:

- Spaces are shown in menu items by the use of an underscore between words.
- An underscore cannot be displayed in the menu text.
- The righthand value of each name/command pair is assumed to be either a menu defined in the menu.ini file or a command.
- A maximum of 16 menu items can display on the screen at a time. Any extra menu items can be reached by using the arrow keys to scroll down.

To modify the user shell menu:

See *Telnet* on page 108 or background information and examples.

NOTE: When adding programs to the menu, make sure the commands do not allow the user to break out of the programs they call.

1. Log into the MergePoint SP manager console as

   root .

2. Open the /etc/menu.ini file for editing.
3. Add new menus and menu items as desired, using underscores (_) to indicate spaces between words. In the [main] menu definition, insert a definition for an action or an option for a submenu, as desired. The following example shows a new menu option with a command defined along with a link to a new subnet identified with the new submenu keyword.

```
[main]
Access_Servers = /bin/spshell
Change_Password = /usr/bin/passwd
```

```
New_Menu_Option = command_pathname_and_options
New_Submenu = newsubmenu
```

4. Add a definition for a submenu using the defined keyword by entering the following:

```
[newsubmenu]
Submenu_Option1 = command_pathname_and_options
Submenu_Option2 = command_pathname_and_options
```

5. Save and quit the file.

Configuring Routes With CLI

The following procedures give examples for using the CLI utility for configuring default, host and network routes and assigning them to interfaces or to gateways.

NOTE: Setting a gateway IP address automatically creates a default route to the gateway's IP address.

To configure routes with CLI:

1. Log into the console as **root**.
2. Enter the **cli** command.
3. Set network interface by entering the following:

```
cli> set network interface <interface_name> address <IP_address>
OK
```

4. Set a default route by setting a gateway IP address by entering the following:

```
cli> set network interface <interface_name> gateway <gatewayIP>
OK
```

5. Add a host in the host table by entering the host's IP address after the **add network hosts** command.

```
cli> add network hosts <hostIP> name <hostname> alias <alias>
```

6. Add a network route by entering the network address after the **add network st_routes** command in the form 1.2.3.0/24.

```
cli> add network st_routes <networkIP/NN>
OK
```

7. For both host and network routes, use the **set network st_routes** command to assign the route to an interface or to a gateway and optionally assign it a metric, by performing the following steps.

   To assign the route to an interface, enter **set network st_routes <IPaddress | networkIPaddress/NN> device <ethN>**. The following screen example shows

assigning the host route created in step 5 to the device eth0 and assigning an optional metric.

```
cli> set network st_routes <IPaddress|networkIPaddress/NN> device eth0
metric <N>
OK
```

-or-

To assign the route to a gateway, enter **set network st_routes <IPaddress | networkIPaddress/NN> gateway <gatewayIP>**. The following screen example shows assigning the network route created in step 6 to the gateway 192.168.2.0.

```
cli> set network st_routes <IPaddress|networkIPaddress/NN> gateway
192.168.2.0
OK
```

Backing Up Configuration Files

MergePoint SP manager administrators can create a compressed backup of all configuration files and store the backup in a specific file. Any compressed configuration file that already resides in the directory is overwritten. The following procedure shows how administrators can back up configuration files in different environments on the MergePoint SP manager.

To back up configuration files:

If you are logged into the web interface as an administrative user, select *System - Import/Export* and click *Export*.

-or-

If you are logged into the console as the root user, enter the following **saveconf** command:

```
root@MergePoint:~# saveconf [path]/<filename>.
```

NOTE: The default path is /storage. If you don't define a path, the configuration file is stored in the /storage directory.

Restoring backed up configuration files

This procedure restores the configuration files to the state they were in when they were last backed up.

NOTE: To perform this procedure, a previous administrator must have previously either run the saveconf command or selected *System - Import/Export* and clicked *Export*, saving changes to the configuration.

To restore the configuration files to the last saved version:

If you are logged into the web interface as an administrative user, select *System -Import/Export* and click *Import*.

-or-

If you are logged into the console as the root user, enter the **restoreconf** command:

```
root@MergePoint:~# restoreconf [path]/<filename>
```

NOTE: The path of the file must be the same path the saveconf command defined. Otherwise, the system attempts to get the file from the /storage directory.

Restoring factory default configuration files

A root user can restore the factory default configuration files from a specific file by performing the following procedure while logged in through the console, Telnet or SSH to restore the configuration files to the state they were in when the MergePoint SP manager shipped.

To restore the factory default configuration files from the command line:

Log into the console as the root user and enter the **restorefactory** command:

```
root@MergePoint:~# restorefactory
```

Shutting down the MergePoint SP Manager

MergePoint SP manager administrators can shut down the appliance at any time through either the web interface or the command line.

CAUTION: Clicking the *Shutdown* button or entering a shutdown command immediately stops all active services and sessions.

To shut down the MergePoint SP manager:

1. If you are logged into the web interface as an administrative user, select *System - Setting* and click *Shutdown*.

   -or-

   If you are logged into the console as the root user, enter the following command to shut down the appliance:

   ```
   root@MergePoint:~# halt
   ```

   -or-

   ```
   root@MergePoint:~# power off
   ```

2. (Optional) Wait one minute, or until you see the shutdown message in the console interface or hear a beeping noise, then unplug the appliance.

Configuring Groups for Use with Authentication Servers

This section applies when an authentication method that relies on an authentication server is configured for the MergePoint SP manager. If the administrator of an authentication server

configures users as members of groups as described in this section, the users do not need to have accounts configured on the MergePoint SP manager.

For example, user johnb is defined as a member of a group with admin privileges on a TACACS+ server, but does not have a user account on the MergePoint SP manager. If the MergePoint SP manager is configured for TACACS+ authentication, johnb can log into the MergePoint SP manager as an administrator.

To support the use of groups with the authentication methods that support groups, the administrator must configure local groups on the MergePoint SP manager using the same group names used on the authentication servers, using the web interface or the CLI utility.

The admin group exists by default. User accounts do not need to be configured on the MergePoint SP manager for the users in the authentication server defined groups.

Configuring group authorization for LDAP authentication

Group authorizations can be provided by either a Windows Active Directory (AD) server or a server running OpenLDAP:

Use the info attribute to define the group name in the format "group_name=<group>;".

For example:

```
group_name=remusergroup;
```

NOTE: Be sure to include the semicolon ';' at the end of the group name.

Configuring group authorizations on an AD server

Perform the following procedures for configuring support for group authorizations when a Windows Active Directory server is used for LDAP authentication.

To install Windows Administration Pack tools and configure the snapin:

1. On the server, install the tools from the Windows Administration Pack. The tools are found on the Windows server installation CD.

NOTE: Before you can add the Active Directory (AD) Schema snap-in to the Microsoft Management Console (MMC), you must register Schmmgmt.dll in AD.

2. To install the AD Schema snap-in, open a command prompt, enter the following command, and then press **Enter**:

   ```
   regsvr32 schmmgmt.dll
   ```

3. Go to the start menu and click *Run*.
4. In the Open field, type **mmc /a** and click *OK*. A console window appears.

5. Click *Console* in the console window menu bar and select *Add/Remove Snapin*. The Add/Remove Snapin window appears.
6. Click *Add*. The Add Standalone Snapins window appears.
7. Select *Active Directory Schema* from the list of snapins and click *Add*.
8. Select *ADSI Edit* from the list of snapins and click *Add*.
9. Click *Close*, then click *OK* in the Add/Remove Snapin window.

To configure Active Directory schema:

CAUTION: Modifying the schema is an advanced operation that is best performed by experienced programmers and system administrators. To have permission to modify the schema, a user must be a member of the Schema Admins group. By default, the only member of the Schema Admins group is the Administrator account in the forest root domain.

1. In the server's console window, double-click *Active Directory Schema*. The Classes and Attributes paths appear.
2. Double-click *Attributes* and confirm that the info attribute is present.
3. Double-click *Classes*, locate the class Users and right-click to select *Properties*.
4. Select the *Attributes* tab and click *Add*.
5. Locate info in the attributes list. Click *Apply*, then click *OK*

To configure a group in ADSI Edit:

1. In the server's console window, double-click *ADSI Edit*.
2. From the menu, select *Action Connect to*. The Connection window appears.
3. Accept the defaults and select *OK*.
4. The path Domain NC<domain>.com appears.
5. Double-click *Domain NC<domain>.com*. The expanded path DC=xxx,DC=xxx,DC=com appears.
6. Double-click *DC=xxx,DC=xxx,DC=com*.
7. The expanded class CN=Builtin appears.
8. Double-click *CN=Users*. The expanded users list appears.
9. Right-click on the name of a user and select *Properties*. The CN=<username> Properties window appears.
10. In the Optional area, select which property to view: *locate* or *select [info]*.

11. In the Edit Attribute field, enter the group name in the format group_name=<Group1>;. If the username selected is an administrative user, enter admin as the group_name.
12. Click *OK* and close or save the windows.

Defining groups on an LDAP server running OpenLDAP

Perform the following procedures for configuring support for group authorizations when a server running OpenLDAP is used for LDAP authentication.

Any groups configured in the memberof attribute are used; if no groups are defined in the member of attribute, then any groups configured in the info attribute are used. The groups defined on the LDAP server must be configured on the MergePoint SP manager with the desired device access authorizations.

To configure groups using the info attribute on an LDAP authentication server:

1. On the server, add the info attribute into the objectclass posixAccount in the /etc/ldap/schema/nis.schema file:

```
objectclass (1.3.6.1.1.2.0 NAME 'posixAccount' SUP top AUXILIARY DESC
'Abstraction of an account with POSIX attributes' MUST ( cn $ uid $
uidNumber $ gidNumber $ homeDirectory ) MAY ( userPassword $ loginShell
$ gecos $ description $ info) )
```

2. Make sure the info attribute exists in the /etc/ldap/schema/cosine.schema file.

```
attributetype (0.9.2342.19200300.100.1.4 NAME 'info'
DESC 'RFC1274: general information'
EQUALITY caseIgnoreMatch
SUBSTR caseIgnoreSubstringsMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{2048} )
```

   Make sure both schema files are listed in slapd.conf:

NOTE: The slapd.conf file is normally located in: [Redhat] /etc/openldap or [bsd] /usr/local/etc/openldap.

```
include /etc/openldap/schema/nis.schema
include /etc/openldap/schema/cosine.schema
```

3. Restart the LDAP service to activate changes.
4. Use the ldapadd(1) command to add new users or the ldapmodify(1) command to assign a user to a group in one of the two following ways:
   a. Enter the user information including the group name on the command line, using the ldapadd command to add new users or the ldapmodify command to modify existing users.

b. Put all user information, including the group definition in a text file and use the text file with the f option on the command line to configure groups for users. Use the following syntax for configuring a group using the info attribute:

```
info: group_name=<Group>;
```

NOTE: To give a user administrative access to the MergePoint SP manager, create a group with the admin role and add the group name to the group_name definition.

Configuring group authorization for RADIUS authentication

The two tasks listed below must be done to configure groups for RADIUS authentication.

- The RADIUS server's administrator must define the desired groups and assign users to the groups. Seethe following procedure.
- The MergePoint SP manager's administrator must configure the RADIUS server on the MergePoint SP manager. The following list defines the values to define when configuring a RADIUS authentication server on the MergePoint SP manager as shown below.

```
auth1 server[:port] secret [timeout] [retries]
acct1 server[:port] secret [timeout] [retries]
```

The following list defines each of the values:

- auth1: the first RADIUS authentication server
- acct1: the first RADIUS accounting server
- server: the RADIUS server address
- port: (optional) the default port name is radius and is looked up through /etc/services.
- secret: the shared password required for communication between the MergePoint SP manager and the RADIUS server
- retries: the number of times each RADIUS server is tried before another is contacted
- timeout: the default is 3 seconds. How long the MergePoint SP manager should wait for the RADIUS server's response.

To configure groups on a RADIUS authentication server:

1. On the server, open the /etc/raddb/users file for editing.
2. Assign groups to a user in the FramedFilterId attribute.
3. Use the format FramedFilterId=:group_name=<Group>;, as shown in the following example:

```
groupuser1 Auth-Type := Local, User-Password == "xxxxxx"
Service-Type=Callback-Login-User,
```

```
Callback-Number=305
Framed-Protocol = PPP,
Framed-Filter-Id = 'group_name=<Group>;',
Fall-Through = No
```

NOTE: If the FrameFilterId already exists, append the group_name declaration to the string. Make sure a final semicolon (;) is at the end of the declaration, as shown in the example.

4. Save and quit the file.

To configure a RADIUS authentication server on the MergePoint SP manager:

1. Log into the console as the root user.
2. Open the /etc/raddb/server file for editing or create the file.
3. Make an entry for the RADIUS server (auth1), an accounting server (acct1) and make an entry for a second RADIUS authentication server (auth2) and for a second accounting server (acct2), by performing the following steps for each server.
4. Follow the file configuration directions shown in the following example.

```
# For proper security, this file SHOULD have permissions 0600,
# that is readable by root, and NO ONE else. If anyone other than
# root can read this file, then they can spoof responses from the
server!
#
# There are 3 fields per line in this file. There may be multiple
# lines. Blank lines or lines beginning with '#' are treated as
# comments, and are ignored. The fields are:
#
# server[:port] secret [timeout] [retries]
#
# the port name or number is optional. The default port name is
# "radius", and is looked up from /etc/services The timeout field is
# optional. The default timeout is 3 seconds. Retries is the number of
times to try # to connect to this server before failing.
#
# If multiple RADIUS server lines exist, they are tried in order. The
# first server to return success or failure causes the module to return
# success or failure. Only if a server fails to response is it skipped,
# and the next server in turn is used.
#
# The timeout field controls how many seconds the module waits before
# deciding that the server has failed to respond.
```

```
#
# server[:port] shared_secret timeout (s)
# 127.0.0.1 secret 1
# otherserver othersecret 3
OUR.RADIUS.SERVER.IP:1645 OurSecret 1 3
```

5. Enter the IP address for the server.
6. (Optional) Define an alternate port.
7. Enter the secret (shared password).
8. (Optional) Enter a value to redefine the time-out.
9. (Optional) Enter a value to redefine the number of retries. The following screen example shows entries that define the RADIUS authentication server and the accounting server to be the same server with the same IP address, sets the secret to avocent, the time-out to 5 seconds and the number of retries to 5.

```
auth1 172.20.0.2 avocent 5 5
acct1 172.20.0.2 avocent 5 5
```

NOTE: Always configure both parameters auth1 and acct1.

10. Save and quit the file.

NOTE: Multiple RADIUS servers can be configured in this file. The servers are tried in the order in which they appear. If a server fails to respond, the next configured server is tried.

Configuring group authorization for TACACS+ authentication

The two tasks listed below must be done to configure groups for TACACS+ authentication.

- The TACACS+ server's administrator must define the desired groups and assign users to the groups.
- The MergePoint SP manager administrator must configure the TACACS+ server on the MergePoint SP manager and set up the TACACS+ server for raw access. For more information see *Configuring group authorization for TACACS+ authentication* on page 118.

The following CLI utility command line can also be used to configure a server for raw access:

```
cli> set auth tacplus service raccess
```

To assign a group to a user on the TACACS+ server:

1. Add a definition for the group to the authentication authorization accounting (AAA) database on the TACACS+ server. Add the raccess service in the form:

```
service = raccess and group_name = <mergepoint group name>;
```

NOTE: These additions can be made through a GUI. The example shows the configuration if a GUI is not available.

```
############################################################
# Group Definitions
############################################################
group = <group name> {
service = raccess {
group_name = <mergepoint group name>;
}
```

2. For user definitions, add the password field in the form `pap=cleartext xxxxxx` and assign the desired tacacs group to the user in the form `member = <tacacs group name>`

```
############################################################
# User Definitions
############################################################
user = <username> {
pap = cleartext xxxxxxx
member = <tacacs defined group name>
}
```

NOTE: Each user may belong to only one group. To give a user administrative access to the MergePoint SP manager, create a group on the MergePoint SP manager with the Admin role and then use this group for the value in the group_name field.

Configuring a TACACS+ authentication server on the MergePoint SP manager

The following list defines the values that must be defined in the MergePoint SP manager's /etc/tacplus.conf file.

- authhost1: IP address of the TACACS+ authentication server. A second TACACS+ authentication server can be configured with the parameter authhost2.
- accthost1: IP address of a TACACS+ accounting server, which can be used to track how long users are connected after being authorized by the authentication server. Its use is optional. If this parameter is not defined, accounting is not be performed. If the same server is used for authentication and accounting, both parameters must be defined with the same address. A second TACACS+ accounting server can be configured with the parameter accthost2.
- secret: The shared secret (password) necessary for communication between the MergePoint SP manager and the TACACS+ servers.
- encrypt: The default is 1, enable encryption. A value of 0 means disable encryption.
- service: The service to be enabled, in this case: raccess.

- protocol: The default is lcp (line control protocol). Specify another parameter if required.
- timeout: The time-out (in seconds) for a TACACS+ authentication query to be answered.
- retries: Defines the number of times a TACACS+ server is tried before another is contacted. The first server authhost1 is tried for the specified number of times, before the second authhost2, if configured, is contacted and tried for the specified number of times. If the second server fails to respond or if no second server is configured, TACACS+ authentication fails.

To configure a TACACS+ authentication server on the MergePoint SP manager:

1. Log into the console as **root**.
2. Open the /etc/tacplus.conf file for editing.
3. Change the values described under Configuring a TACACS+ authentication server on the MergePoint SP manager.

NOTE: To configure group access on the TACACS+ authentication server, the service must be defined as raccess.

4. Save and quit the file.

CHAPTER 7

Using the CLI Utility

CLI Utility Overview

An administrator (the root user, the admin user or a member of the admin group) can configure the MergePoint SP manager using the CLI utility. While in the CLI utility, an administrator can escape to the shell and when finished can return to the CLI utility.

Administrators often prefer using the CLI utility over the web interface because they can run frequently performed CLI configuration commands from shell scripts or from text files that can be executed in batch mode. For example, on a MergePoint SP manager with 40 private Ethernet ports, configuring all the service processors one by one could be tedious and prone to error, so scripting the configuration of multiple service processors at one time is a good use of the CLI utility.

The CLI utility provides a set of commands (described under see *CLI Commands* on page 126) that act on parameters nested in a format called the CLI parameter tree. Some parameters require arguments when the parameters are entered with some commands.

NOTE: This section describes the CLI commands and how to navigate the CLI parameter tree, but it does not describe all the parameters and values.

NOTE: In the examples in this section, the failover parameter in the /network/interface/mode directory is only for the MergePoint SP5x24/SP5x40 manager.

Execution Modes

The CLI utility has three modes: a command line mode, interactive mode and batch mode.

Command line mode

Command line mode refers to when the CLI utility is invoked on the Linux command line with options, commands, parameters and values.

The CLI utility performs the specified commands, displays any values requested by a command (such as the **get** command) and returns the shell prompt. To commit the changes made in

command line mode, make sure to use the **-C** option as part of the command line. See *CLI Options* on page 122.

When invoked without commands, CLI enters interactive mode; see *Interactive mode* on page 122. When the CLI utility is invoked with the **-f <file>** option or is invoked from a script, the commands are executed in batch mode from the specified file or script. See *CLI Options* on page 122.

Interactive mode

Interactive mode is entered by invoking CLI on the command line. The cli> prompt appears, and the administrator performs configuration by entering commands followed by parameters followed by parameter arguments at the cli> prompt. The CLI utility waits for new commands until the user enters the **quit** or **exit** command. You must enter the **commit** command for changes to take effect.

Batch mode

Batch mode refers to invoking CLI commands from a file as follows:

CLI commands can be saved in a plain text file and executed in batch mode by invoking the CLI utility with the **-f <file>** option.

- CLI commands can be used in any kind of shell script:
  - **#!/usr/bin/cli** can be invoked at the top of a shell script if the script contains only CLI commands.
  - Any type of shell can be used to run CLI commands along with other commands.

CLI Options

Administrators can invoke the CLI command with a number of different options shown in the following table.

Table 7.1: CLI Utility Options

Option	Description
-1	Single command only (no effect in interactive mode).
-C	Commits changes automatically when quitting.
-f <file>	Reads commands from <file>. Used for running commands in batch mode. **NOTE:** You may use "**-**" for stdin, such as **cli -f -**.

Option	Description
-c <file>	Used for running cli.conf from <file> when cli.conf is not under the default path: **/etc/cacpd**.
-p <file>	Used for running param.conf from <file> when param.conf is not under the default path: **/etc/cacpd**.
-m <file>	Used for running modules.conf from <*file*> when modules.conf is not under the default path: **/etc/cacpd**.
-h	Help. Shows a brief summary of command line options.
-q	Quiet mode; don't show the startup greeting.
-V	Show CLI version.

CLI Parameters and Arguments

The CLI configuration options are organized in a hierarchy called a parameter tree. You can use the **get**, **show** and **list** commands to show parameters. You can also use the **get** command to show the values of individual parameters at the end of a branch.

Each branch in the parameter tree in the MergePoint SP manager CLI is made up of one or more parameters, one nested below the other. For example, the top level network parameter may be followed by the second level interface parameter, which then may be followed by the third level mode parameter. In this branch, the only commands supported would be **get** and **set**. All of the parameters in a branch are entered together on a single CLI command line. For example, to get the value, then set the mode for failover, you would enter the following command:

```
cli> get network interface mode
normal
cli>
```

To set failover, you would enter the following command in interactive mode:

```
cli> set network interface mode failover
OK
cli>
```

You can use autocompletion with the set command to find out the accepted values:

```
cli> set network interface mode <Tab><Tab>
Set interface mode: normal, interface or bridge.
```

To add a user called mozart, you would enter the following:

```
cli> add spmanager user mozart
```

```
OK
```

Entering a command in interactive mode

Based on the branch mentioned at the beginning of this section, you could enter the **set** command with the following parameters in interactive mode to turn on Ethernet failover.

```
admin@MergePoint:~$ cli
cli> set network interface mode failover
ok
cli>
```

Entering a command in command code

Based on the branch mentioned at the beginning of this section, you could enter the **set** command to turn on Ethernet failover with the parameters shown in the following screen example in command mode. When the command completes, the shell prompt returns. On the command line, you could enter all the parameters together with the value on the same command line.

```
admin@MergePoint:~$ cli -C1 set network interface mode failover
ok
admin@MergePoint:~$
```

Entering a command in batch mode

Based on the example in this section, you could use batch mode to turn on Ethernet failover as shown in the following examples.

Example CLI shell script

Start the script by entering #!/usr/bin/cli with the -Cf options:

```
#!/usr/bin/cli -Cf
set network interface mode failover
```

You could then make the script executable and execute it on the command line, as shown in the following example.

```
root@MergePoint:~$ chmod 777 scriptname1
root@MergePoint:~$ ./scriptname1
```

Example bash shell script

If you want to run a CLI command from the same script that is running other Linux commands, you could put the command in another type of shell script. The bash shell is shown in the following example:

```
#!/bin/bash
...
```

```
/usr/bin/cli -C set network interface mode failover
...
```

If you want to run multiple CLI commands from a script that is also running other Linux commands, you could add the multiple CLI commands as shown in the following example:

```
#!/bin/bash
...
/usr/bin/cli <<EOF
set network interface mode failover
set network hostname frutabaga
commit
EOF
```

You could then make the script executable and execute it on the command line, as shown in the following example:

```
root@MergePoint:~$ chmod 777 scriptname2
root@MergePoint:~$ ./scriptname2
```

Example plain text file

You can put one or more commands in a plain text file without invoking any shell as shown in the following example.

```
set network interface mode failover
```

Then you can invoke the CLI command with the **-f <file>** option to execute the command(s) from the file, as shown in the following example.

```
root@MergePoint:~$ cli -f filename
```

Autocompletion

Autocompletion can be used to find out what commands and parameters are available. Pressing the **Tab** key twice displays all the commands at the top level, as shown in the following screen example.

```
cli> <Tab><Tab>
add commit exit list rename set show
cd delete get quit revert shell version
```

Typing any of the commands such as **add** or **set** then pressing **Tab** twice displays all the top level parameters, as shown in the following screen example.

```
cli> set<Tab><Tab>
adsap2 cards network snmpd syslog
auth dhcpd ntp spmanager timezone
```

```
bootconf iptables pxe sshd tcpdump
```

Pressing **Tab** once after partially typing a parameter name automatically completes the parameter name, unless there is more than one parameter name beginning with the typed characters. If more than one parameter name begins with the typed characters, then **Tab Tab** displays them all.

NOTE: The **bootconf** and **cards** commands are only for MergePoint SP5x24/SP5x40 manager.

Examples

```
cli> s<Tab><Tab>
set shell show
cli> se<Tab>
cli> set
cli> set n<Tab><Tab>
network ntp
cli> set ne<Tab>
cli> set network
cli> set network <Tab><Tab>
hostname hosts interface resolv st_routes
cli> set network i<Tab>
cli> set network interface
cli> set network interface eth0 <Tab>
address alias gateway method mtu netmask
address6 broadcast gateway6 method6 mtu6 netmask6
```

CLI Commands

The CLI utility supports the commands that are described in the following sections with examples.

```
cli> <Tab><Tab>
add commit exit list rename set show
cd delete get quit revert shell version
```

add

The **add** command adds the last parameter and sets it to the default value (if any). Any nondefault values must be set using the **set** command.

The **add** command is used instead of **set** when multiple parameters of the same type can exist. For example, add network hosts <IP address> makes an entry for a host with the specified IP address in the hosts list. In that case, add is used because multiple hosts can exist.

In contrast, the **set** command (as in: set network interface eth0 address <IPaddress>) is used to specify the IP address for the eth0 Ethernet interface. In that case, the **set** command is used because each interface has only one IP address.

Adding certain parameters causes one or more related parameters to be added to the subtree. For example, when an IP address is added to the hosts list, empty hostname and alias parameters are also added. For some parameters, a set of meaningful default values are assigned. For empty parameters, the **get** or **show** commands list the parameter names without any values.

You must add parameters in a prescribed order. For example, because an empty hostname and alias parameters are created when you add a host's IP address, you cannot add a host by name before specifying the host's IP address, and you cannot specify the host name at the same time as its IP address. To specify a name or alias for a host you need to add the host first by adding its IP address, then you need to use the **set** command to specify its name and alias.

Synopsis

```
add parameter(s) value(s)
```

Examples

```
cli> set network hosts 192.168.160.11 name fruitbat
'name' doesn't make sense in its context.
[set network hosts 192.168.160.11 name fruitbat] Failed: Invalid input
cli> get network hosts 192.168.160.11 name
Words 4 and following were ignored.
cli> add network hosts 192.168.160.11
OK
cli> get network hosts 192.168.160.11
network hosts 192.168.160.11 name
network hosts 192.168.160.11 alias
cli> set network hosts 192.168.160.11 name fruitbat alias fbat
OK
cli> get network hosts 192.168.160.11
network hosts 192.168.160.11 name: fruitbat
network hosts 192.168.160.11 alias: fbat
```

Parameters that can be added

The following table shows the parameters that can be added using the **add** command. *Summary of How to Configure the Top Level Parameters* on page 136 shows additional parameters and values that must be set for each parameter after the parameter is added. When a parameter is shown in the Parameter Level 2 column, the Parameter Level 1 and Parameter Level 2 parameters must be entered together with the **add** command; for example, to add a service

processor user, you must enter **add spmanager user <username>**; the user must then be configured after adding, using the **set** command.

Table 7.2: Parameters that Work with the CLI add Command

Parameter Level 1	Parameter Level 2	What It Configures (Syntax)
dhcpd	mapping	Add a MAC address for IP. **Synopsis:** add adhpd mapping <MAC_address> **Example:** add dhcpd mapping 00602e01d9a6 **NOTE:** No colon (:) is needed in the MAC address. See the set command for the following parameters: *dhcpd setting subnet* on page 138, *dhcpd setting relay* on page 138 and *dhcpd mapping* on page 138.
iptables	nat | filter	Firewall configuration. Add a new rule to NAT table and filter table. **Synopsis:** add iptables nat [PREROUTING|POSTROUTING|OUTPUT] <number>| filter [INPUT|OUTPUT|FORWARD] <chainname> <number> **Example:** add iptables nat PREROUTING 0
network	interface	Add an alias to an interface. **Synopsis:** add network interface <interface> alias <alias_name> **Example:** add network interface eth1 alias yd
	hosts	Add an IP address for a host. **Synopsis:** add network hosts <IPaddress> **Example:** add network hosts 172.26.25.178
	st_routes	Add to the list of static route targets a subnet or host (networks in the form 1.2.3.0/24 or host IPs). **Synopsis:** add network st_routes <network_IPaddress/netmask> | <host_ IPaddress> **Example:** add network st_routes 1.1.1.1

Parameter Level 1	Parameter Level 2	What It Configures (Syntax)
pxe	mapping	Add a MAC address. **Synopsis:** add pxe mapping <MAC_ address> **Example:** add pxe mapping 00602e01d9a6 **NOTE:** No colon (:) is needed in the MAC address. See the set command for the following parameters: *pxe mapping* on page 142 and *pxe setting* on page 143.
snmpd	user	Add a user and fills in the subtree with default values and randomly generated passwords. **Synopsis:** add snmpd user <user_name> **Example:** add snmpd user user1
	group	Add a group. **Synopsis:** add snmpd group <group_name> **Example:** add snmpd group g1
	view	Add a view. **Synopsis:** add snmpd view <view_name> **Example:** add snmpd view ies
	access	Add an access type. **Synopsis:** add snmpd access <noauth|auth|authpriv> **Example:** add snmpd access auth
	com2sec	Add a com2sec type. **Synopsis:** add snmpd com2sec <type> **Example:** add snmpd com2sec mp1
	proxy	Add an snmpd proxy. **Synopsis:** add snmpd proxy <proxy_name> **Example:** add snmpd proxy 0

Parameter Level 1	Parameter Level 2	What It Configures (Syntax)
syslog	destination	Add the name of syslog server to the default console or rootuser destinations defined for syslog messages. **Synopsis:** add syslog destination <server_name> **Example:** add syslog destination dest1
spmanager	server	Two steps are required to add a server to the appliance: 1) Add a managed device to the appliance. **Synopsis:** add spmanager server <device_name> 2) Configure the device parameters for the appliance. **Synopsis:** set spmanager server <devicename> account_verify <yes|no> type <typename> ip <IP address> user <username> password <password> group <group name> **Example:** add spmanager server 172.26.25.236 set spmanager server 172.26.25.236 account_verify no type IBMBC ip 172.26.25.236 user USERID password PASSW0OD group MergePoint **NOTE:** The group means the server group. The default group is MergePoint. To specify an alias or sol port to the server, see the set command for the following parameter: *spmanager server* on page 145.
	user	Add the name of a user authorized to access the appliance. **Synopsis:** add spmanager user <username> **Example:** add spmanager user user11 **NOTE:** To set a device or a role to the user, see the set command for the following parameter: *spmanager user* on page 146.
	group	Add the name of a user group. **Synopsis:** add spmanager group <group_name> **Example:** add spmanager group g1 **NOTE:** To specify a device or a user to access the group, see the set command for the following parameter: *spmanager group* on page 145.

Parameter Level 1	Parameter Level 2	What It Configures (Syntax)
	server-groups	Add the name of a server group. **Synopsis:** add spmanager server-groups <groups_name> **Example:** add spmanager server-groups MergePoint2. **NOTE:** To add a device into a server group, see the set command for the following parameter *spmanager server* on page 145.
	global role	Add an appliance user role. **Synopsis:** add spmanager global role <role_name> **Example:** add spmanager global role role_aa **NOTE:** To set the privilege of the global role, see the set command for the following parameter: *spmanager global role* on page 146.

cd

The **cd** command sets a parameter prefix for subsequent commands. The prompt then changes to indicate the prefix. Entered by itself, cd returns to the top level.

Synopsis

```
cd [parameter(s)]
```

Examples

```
cli> cd network
network> get hostname
dingo
network> set hostname kookaburra
OK
network> cd interface eth0
network interface eth0> set <tab><tab>
address alias broadcast gateway method mtu netmask
network interface eth0> set address 192.168.160.10 netmask 255.255.255.0
OK
network interface eth0> cd ..
network interface> cd eth1
network interface eth1> set address 192.168.50.10
OK
```

```
network interface eth1> cd
cli>
```

commit

The **commit** command saves changes in configuration files and creates a compressed copy of the configuration files in a backup directory.

NOTE: If you make a change but do not commit it, the configuration files are not updated, and your changes will be lost after the next reboot.

Synopsis

```
commit
```

delete

The **delete** command deletes the last parameter in the command line. Deleting certain parameters deletes associated parameters. For instance, if an IP address is deleted from the host list, other parameters associated with a host (name, alias) are also deleted.

Synopsis

```
delete parameter(s)
```

Some existing parameters cannot be deleted by any user or administrator. However, any parameter that can be added by an administrator can also be deleted by an administrator.

Examples

```
cli> get network hosts 192.168.160.11
network hosts 192.168.160.11 name: fruitbat
network hosts 192.168.160.11 alias: fbat
cli> delete network hosts 192.168.160.11
OK
cli> set network hosts 192.168.160.11 name fruitbat
'name' doesn't make sense in its contest.
[set network hosts 192.168.160.11 name fruitbat] Failed: Invalid input
cli> get network hosts 192.168.160.11 alias: fbat
Words 4 and following were ignored.
```

get | show

The **get** command retrieves the value assigned to a parameter. When no parameters are listed, the whole parameter tree is displayed. If full parameters are specified, the assigned value is displayed.

Synopsis

```
get | show parameter(s)
```

Examples

```
cli> get network hostname
anchovy
cli> show network resolv domain
avocent.com
```

When get is entered with a partial parameter, all the subtrees display. In the output, if a value is assigned, the parameter preceding the value ends with a semicolon.

```
cli> get network
network interface failover: no
network interface eth0 method: dhcp
...
network hosts 127.0.0.1 name: MergePoint
network hosts 127.0.0.1 alias: localhost
network st_routes
cli>
```

If the system assigns default values, default values are shown next to the automatically added parameter name, as in the following example, which was entered on the MergePoint SP manager before any configuration has been done.

```
cli> get network interface eth0
network interface eth0 method: dhcp
network interface eth0 address: 192.168.160.10
...
network interface eth0 gateway: none
network interface eth0 mtu: 1500
network interface eth0 alias
cli>
```

NOTE: If you make a change but do not commit the change (see *commit* on page 132), the configuration files are not updated. The get command shows the changes that are currently stored in the RAM memory, not the actual value stored in the affected configuration file.

list

The **list** command lists all available parameters. With no parameters listed, the whole parameter tree is displayed. If parameters are specified, the corresponding subtree is displayed.

Synopsis

```
list parameter(s)
```

Example

```
cli> list network hosts
```

```
127.0.0.1
127.0.0.1 name
127.0.0.1 alias
192.168.160.10
192.168.160.10 name
192.168.160.10 alias
```

quit | exit

The **quit** command closes the CLI utility. (**Ctrl+d** also quits the CLI utility.) If changes have not been committed, the user is prompted to commit the changes or quit without committing.

Synopsis

```
quit
```

Example

```
cli> set network hostname frutabaga
OK
cli> quit
You have made changes but haven't committed them yet.
To commit the changes, use the "commit" command.
To revert all changes and quit without committing, use "quit!".
cli> commit
cli> quit
```

quit!

The **quit** command closes the CLI utility and discards any uncommitted changes.

rename

The **rename** command renames parameter. Depending on the parameter, this may result in a whole subtree of parameters being moved. For instance, if an IP address in the host list is changed, all parameters associated with that host (name, alias) are moved under the new name.

Synopsis

```
rename parameter(s) value(s)
```

Examples

```
cli> get network hosts 192.168.160.11
network hosts 192.168.160.11 name: fruitbat
alias
cli> rename network hosts 192.168.160.11 192.168.160.222
OK
cli> get network hosts 192.168.160.11
```

```
ERR No such file or directory
cli> get network hosts 192.168.160.222
name fruitbat
alias
```

set

The **set** command sets the value(s) of the last parameter. When multiple parameters are specified in one command, either all are set successfully or none of the values are changed.

The **set** command is used to set an existing value, in contrast to add command which is used to add something to the parameter tree. For example, this set command is used to specify the IP address for an Ethernet interface which already is identified by the eth0 parameter in the parameter tree: set network interface eth0 address <IPaddress>. In contrast, new hosts need to be added with the add command before their parameters can be specified; add network hosts <IPaddress> makes an entry for a host with the specified IP address in the hosts list. Parameters for this new host can then be changed with the set command: set network hosts <IPaddress> name <hostname>.

Synopsis

```
set parameter(s) value(s)
```

Examples

```
cli> set network resolv dns0 10.0.0.1
OK
cli> set network interface eth1 address 10.0.0.3 netmask 255.255.255.0
broadcast 10.0.0.255
OK
```

shell

The **shell** command escapes to the shell.

Synopsis

```
shell
```

Examples

```
cli> shell
root@MergePoint:~#
root@MergePoint:~# whoami
root
root@MergePoint:~# logout
cli>
```

revert

The **revert** command discards any changes and reverts to previously committed state.

Synopsis

```
revert
```

Examples

```
cli> get network hostname
dingo
cli> set network hostname kookaburra
OK
cli> get network hostname
kookaburra
cli> revert
OK
cli> get network hostname
dingo
```

version

The **version** command displays the current CLI version.

Synopsis

```
version
```

Examples

```
cli> version
MergePoint CLI 2.0 (2007-06-16T13:47+1000)
```

Summary of How to Configure the Top Level Parameters

This section provides a brief overview of how to configure the top level parameters.

The following table describes which of the top level parameters that you can set without using the **add** command first, and it also shows the parameters that need to be set after the **add** command creates the parameter to set additional parameters and values.

Table 7.3: Setting Top Level CLI Parameters

Parameter	Command
adsap2	Avocent DS Authentication Protocol configuration. **Synopsis:** set adsap2 state <secure | trust-all> authserver <ip-address> **Example:** set adsap2 state trust-all authserver 2.2.2.2 **NOTE:** The state of "secure" means the server is being managed by the DSView 3 software, while the state of "trust-all" means the server is unmanaged by the DSView 3 software. The parameter "authserver" specifies the IP address of authorization server.
auth	Use the **set** command with the *type* parameters to set an authentication type for logins to the MergePoint SP manager, either krb5, ldap, nis, radius, smb, or tacplus. Use the **set** command with the auth type ppp parameters to set an authentication type for logins through the auxport modem and pcmcia/cardbus modems. Authentication types supported for the MergePoint SP manager and for SPs are listed in *Configuring External Authentication Services* on page 95. **Synopsis:** set auth type <typename> nis domainname <name> server <ip|broadcast> radius|tacplus accthost <server-name> authhost <server-name> secret <secret> timeout <count> retries <count> tacplus service <ppp|raccess> krb5 realm <realm> server <ip-address> ldap host <host> base <base-name> binddn <dn> bindpw <password> pam_login_attribute <attribute> ssl <on|off|start_tls> smb domain <name> server <ip-address> **Example:** set auth type local nis domainname subavt server 1.1.1.1 radius authhost1 a1 authhost2 a2 accthost1 c1 accthost2 c2 secret pwd timeout 4 retries 2 tacplus authhost1 1.1.1.1 authhost2 12.2.2.2 accthost1 1.1.1.1 accthost2 12.2.2.2 secret pwdd retries 2 timeout 4 service ppp krb5 realm dm server 2.2.2.2 ldap host 127.0.0.1 base dc=padl,dc=com binddn bdl bindpw pwd pam_login_attribute df ssl on smb domain sudom server1 2.2.2.1 server2 3.3.3.3

Parameter	Command
bootconf	Use the **set** command to configure boot configuration. **Synopsis:** set bootconf wdt <yes|no> mac <mac address> ip <ip address> bootfile <file name> serverip <tftp server ip> baudrate <1200|2400|4800|9600|19200|38400|57600|115200> fecmode1|fecmode2 <auto|100F|100H|100F|10F|10H> BF_curr < 0| 1 |2> **Example:** set bootconf wdt yes mac 00:60:2e:01:d9:a6 ip 172.26.25.177 bootfile uImage.4.0.0.28 baudrate 9600 fecmode1 auto fecmode2 auto BF_curr 1 **NOTE:** This parameter is only for the MergePoint SP5x24/SP5x40 manager.
dhcpd setting subnet	Use the **set** command to configure dhcpd settings. **Synopsis:** set dhcpd setting subnet <subnet name> range_low <start ip> range_high <end ip> **Example:** set dhcpd setting subnet 199 range_low 199.1.1.1 range_high 199.1.1.160
dhcpd setting relay	Use the **set** command to specify a DHCP relay server. **Synopsis:** dhcpd setting relay server <relay server> status <yes/no> **Example:** set dhcpd setting relay server 172.26.25.3 status yes
dhcpd mapping	Use the **set** command to specify an IP address for added MAC. **Synopsis:** set dhcpd mapping <MAC_address> ip <ip_address> **Example:** set dhcpd mapping 00602e01d9a6 ip 1.1.1.1 **NOTE:** See the add command for the following paramter: *dhcpd* on page 128.

Parameter	Command
iptables [filter | nat]	By default, a set of chains is defined with hidden rules. For NAT, the predefined chains are: PREROUTING, POSTROUTING, OUTPUT. For filter, the predefined chains are: INPUT, OUTPUT, FORWARD. For background information, see *Firewall/Packet Filtering* on page 25. Use the **set** command to configure a rule for a predefined chain after the **add** command is used to add a rule for that chain. Or use the **set** command to configure a rule after the **add** command is used to add a new chain and to add a new rule for the new chain (set iptables) <filter | nat> **<Tab> <Tab>** shows the current chains; set iptables <filter | nat> <chainname> shows the rules for a specific chain, and get iptables <filter | nat> <chainname> <rule_number> shows the configuration parameters to set filtering policies. **Synopsis:** set iptables nat PREROUTING|POSTROUTING|OUTPUT <number> | filter INPUT| FORWARD|OUTPUT <number> destination <ip> inv <yes|no> source <ip> inv <yes|no> protocol <pro> inv <yes|no> dport <port> inv<yes|no> sport <port> inv<yes|no> in-interface <in> inv<yes|no> out-interface <out> inv<yes|no> fragment <head|nonhead|all> target <rule> to-source <ip> to-destination <ip> **Example:** set iptables nat PREROUTING 0 destination 127.2.2.2 inv yes source 127.2.2.1 inv yes protocol tcp inv no dport 9000 inv no in-interface eth0 inv no fragment head **NOTE:** The parameters dport and sport are only available if the protocol is tcp or udp.
network hostname	Use the **set** command to configure the hostname for the MergePoint SP manager. **Synopsis:** set network hostname <hostname> **Example:** set network hostname MergePoint1 **NOTE:** By default the hostname is MergePoint.

Parameter	Command
network hosts	After the **add** command is used to add a host to the hosts table, use the **set** command to configure the host's IP address and optional alias. **Synopsis:** set network hosts <IPaddress> name <host_name> alias <alias_name> **Example:** set network hosts 192.168..100 host MergePoint5300 alias MP5300 **NOTE:** See the add network hosts command in *The following table shows the parameters that can be added using the add command. Summary of How to Configure the Top Level Parameters on page 136 shows additional parameters and values that must be set for each parameter after the parameter is added. When a parameter is shown in the Parameter Level 2 column, the Parameter Level 1 and Parameter Level 2 parameters must be entered together with the add command; for example, to add a service processor user, you must enter add spmanager user <username>; the user must then be configured after adding, using the set command.* on page 127.
network interface eth0|eth1 for IPv4	Use the **set** command to configure one of the network interfaces with IPv4 for the MergePoint SP5x00 manager. **Synopsis:** set network interface eth0|eth1 method <static|dhcp> address <ip> netmask <netmask> broadcast <broadcast> gateway <ip> mtu <num> alias <alias name> **Example:** set network interface eth1 method static address 192.168.1.100 netmask 255.255.255.0 gateway 192.168.1.1
network interface bond0|eth0|eth1|priv0|br0 for IPv4	Use the **s**et command to configure one of the network interfaces with IPv4 for the MergePoint SP5x24/SP5x40 manager. **Synopsis:** set network interface bond0|eth0|eth1|priv0|br0 method <static|dhcp> address <ip> netmask <netmask> broadcast <broadcast> gateway <ip> mtu <num> alias <alias name> **Example:** set network interface br0 method static address 192.168.1.100 netmask 255.255.255.0 gateway 192.168.1.1 set network interface priv0 address 192.168.1.120 netmask 255.255.255.0

Parameter	Command
network interface eth0|eth1 for IPv6	Use the **set** command to configure one of the network interfaces with IPv6 for the MergePoint SP5x00 manager. **Synopsis:** set network interface eth0|eth1 method6 <dhcpv6|static> address6 <ip> netmask6 <netmask> gateway6 <ip> mtu6 <num> **Example:** set network interface eth1 method6 static set network interface eth1 address6 fe80:2001::2 netmask6 64
network interface bond0|eth0|eth1| priv0|br0 for IPv6	Use the **set** command to configure one of the network interfaces with IPv6 for the MergePoint SP5x24/SP5x40 manager. **Synopsis:** set network interface bond0|eth0|eth1|priv0|br0 method6 <dhcpv6|static> address6 <ip> netmask6 <netmask> gateway6 <ip> mtu6 <num> **Example:** set network interface bro method6 static set network interface br0 address6 fe80:2001::2 netmask6 64
Note for IPv6	Method6 has 2 valid value: dhcpv6, static. dhcpv6 - Interface gets its ipv6 address from dhcp server and other network settings from ipv6 RA or other valid information. static - You must set ipv6 address and other network settings manually. Netmask6 is a number with value between 1 and 128. IPv6 addresses are 16-byte numbers written in hexadecimal in blocks of 2-bytes separated by a colon. As an example: fdeb:8024:0000:0023:0000:0000:0a05:a0da. Leading zeros can be removed, changing our example into fdeb:8024:0:23:0:0:a05:a0da. One or more zeroed blocks can be substituted by a single "::", but only one such a substitution is allowed. This gives us two possibilities for our previous example: • fdeb:8024::23:0:0:a05:a0da • fdeb:8024:0:23::a05:a0da Note that fdeb:8024::23::a05:a0da is not allowed because it is ambiguous. Netmask6, also know as prefix length in IPv6 context, are usually encoded as the number of bits in prefix. Mtu6 is a number with value between 1 and 1500.

Parameter	Command
network interface mode	Use the **set** command to specify a mode. **Synopsis:** set network interface mode normal|failover|bridge **Example:** set network interface mode bridge **NOTE:** This parameter is only for the MergePoint SP5x24/SP5x40 manager.
network resolv	Use the **set** command to configure DNS domain and one or more DNS servers. **Synopsis:** set network resolv dns0|dns1 <DNS_IP> domain <domain_name> **Example:** set network resolv dns0 172.26.24.3 dns1 172.20.1.11 domain corp.avo.com
network st_routes	After using the **add** command to add a static route to the routing table, use the **set** command to configure the static route. **Synopsis:** set network st_routes <ip> [gateway <ip>] [device <interface name>][metric <num>] **Example:** set network st_routes 1.1.1.1 device eth2 metric 0 **NOTE:** See the add command for the following second level parameter: *st_routes* on page 128.
ntp server	Use the **set ntp** command to specify an internet time server to sychronize. **Synopsis:** set ntp server <ip or hostname> **Example:** set ntp server clock.redhat.com
ntp enabled	Use the **set ntp** command to run the ntp server. **Synopsis:** set ntp enabled <yes|no> **Example:** set ntp enabled yes
pxe mapping	Use the **set** command to specify an IP address for added MAC. **Synopsis:** set pxe mapping <mac> ip <ip-address> **Example:** set pxe mapping 00602e01d9a6 ip 2.2.2.2 **NOTE:** See the add command for the following parameter: *pxe* on page 129.

Parameter	Command
pxe setting	Use the **set** command to configure pxe settings. **Synopsis:** set pxe setting subnet <subnet> netmask <mask> gateway <gateway> sp_user <user name> sp_pwd <password> range_low <ip_address> range_high <ip_address> vlan_enable <yes|no> vlan_id <num> vlan_priority <num> **Example:** set pxe setting subnet 343 netmask 255.255.255.0 gateway 2.2.2.2 sp_user usr1 sp_pwd dff range_low 1.1.1.1 range_high 1.1.1.5 vlan_enable yes vlan_id 3 vlan_priority 2
snmpd access	After using the **add snmpd** command to add access, use the **set snmpd** command to configure the parameters. **Synopsis:** set snmpd access **Example:** set snmpd access **NOTE:** See the add command for the following second level snmpd parameter: *access* on page 129.
snmpd com2sec	After using the **add snmpd** command to add com2sec, use the **set snmpd** command to configure the parameters. **Synopsis:** set snmpd com2sec<name> context <context> source <src> name <words> **Example:** set snmpd com2sec mp1 context contxt source 123.23.1.1 name mp **NOTE:** See the add command for the following second level snmpd parameter: *com2sec* on page 129.
snmpd group	After using the **add snmpd** command to add group, use the **set snmpd** command to configure the parameters. **Synopsis:** set snmpd group <grp> sec_model <v1|v2c|usm> sec_name <name> **Example:** set snmpd group g1 sec_model v1 sec_name serc1 **NOTE:** See the add command for the following second level snmpd parameter: *group* on page 129.

Parameter	Command
snmpd proxy	After using the **add snmpd** command to add proxy, use the **set snmpd** command to configure the parameters. **Synopsis:** set snmpd proxy <num> context <name> version <1|2c|3> community|user <name> oid <oid> sec_level <level> authmethod <MD5|SHA> authpass <pwd> privmethod <DES|AES> privpass <pwd> **Example:** set snmpd proxy 0 user user1 oid .1.1.1.1.1.10 sec_level 2 authmethod MD5 authpass 23545 privmethod DES privpass e4543 **NOTE:** See the add command for the following second level snmpd parameter: *proxy* on page 129.
snmpd user	After using the **add snmpd** command to add user, use the **set snmpd** command to configure the parameters. **Synopsis:** set snmpd user <user> authmethod <SHA|MD5> authpass <pwd> cryptmethod <DES|AES> cryptpass <pwd> **Example:** set snmpd user user1 authmethod SHA authpass ert8Gftty cryptmethod DES cryptpass syOUSfda **NOTE:** See the add command for the following second level snmpd parameter: *user* on page 129.
snmpd view	After using the **add snmpd** command to add view, use the **set snmpd** command to configure the parameters. **Synopsis:** set snmpd view <name> <0|1|2|3|4|5> incl_excl <included|excluded> subtree <oid> mask <hex> **Example:** set snmpd view ies 0 incl_excl included mask ff subtree .1.1.1.1.1.0 **NOTE:** See the add command for the following second level snmpd parameter: *view* on page 129.
snmpd syslocation|syscontact	Use the **set** command to specify the location of the system and the contact information. **Synopsis:** set snmpd syslocation <location name> syscontact <info> **Example:** set snmpd syslocation MergePoint syscontact Avt

Parameter	Command
spmanager group	After using the **add** command to configure a user group, use the **set** command to configure the parameters. **Synopsis:** set spmanager group <name> user <name> target <target> **Example:** set spmanager group g1 user user1 target 172.26.25.39 **NOTE:** See the add command for the following second level spmanager parameter: *group* on page 130.
spmanager server	After using the **add** command to configure a device, use the **set** command to configure the parameters such as account_verify, type, ip, group, alias, user, password or sol port. The account_verify "yes" indicates that the server is added with user account verification; while the account_verify "no"indicates that the server is added without user account verification. **Synopsis:** set spmanager server <devicename> account_verify <yes|no> ip <server_IP> group <server-group> alias <alias_name> user <username> password <pwd> sol_port <port> **Example:** set spmanager server 172.26.25.121 account_verify no type ilo ip 172.26.25.121 user root password admin sol_port 9500 set spmanager server 172.26.25.121 account_verify yes user root password admin **NOTE:** You can set an unverifed server to a verified server; but you cannot set a verified server to an unveified server. See the add command for the following second level spmanager parameter: *server* on page 130.

Parameter	Command
spmanager user	After using the **add** spmanager user command to configure a user, use the **set** user command to configure the user's parameters: role and target. **Synopsis:** set spmanager user <name> role <role name> target <target> **Example:** set spmanager user user11 role operator target 172.26.25.179 **NOTE:** The range of a role name is admin, operator, user and user defined role(s). To add a user role, see the add spmanager global role command in *The following table shows the parameters that can be added using the add command. Summary of How to Configure the Top Level Parameters on page 136 shows additional parameters and values that must be set for each parameter after the parameter is added. When a parameter is shown in the Parameter Level 2 column, the Parameter Level 1 and Parameter Level 2 parameters must be entered together with the add command; for example, to add a service processor user, you must enter add spmanager user <username>; the user must then be configured after adding, using the set command.* on page 127. See the add command for the following second level spmanager parameter: *user* on page 130.
spmanager global role	After using the **add** spmanager global role command to add a user role, use the **set** command to configure the user role's privileges -the device management actions. **Synopsis:** set spmanager global role <name> privilege power <yes|no> coldest <yes|no> directcommand <yes|no> pxe <yes|no> snmp <yes|no> lan <yes|no> user <yes|no> alert <yes|no> sol <yes|no> bmctime <yes|no> sel <yes|no> sensor <yes|no> spconsole <yes|no> devconsole <yes|no> rdp <yes|no> **Example:** set spmanager global role role_aa privilege power yes pxe yes **NOTE:** See the add command for the following second level spmanager parameter: *global role* on page 131.
sshd protocol	Use the **set sshd protocol** command to set the SSHD protocol version to either 1 or 2 or both (1,2 or 2,1). Default is 2,1. **Synopsis:** set sshd protocol <1|2|1,2|2,1> rootlogin <yes|no> port <num> **Example:** set sshd protocol 1 rootlogin no port 22 **NOTE:** Using this command is not recommended. Changed SSHD protocol version or SSHD port may cause some features from the web interface to fail.

Parameter	Command
syslog destination	Use the **set syslog destination** command parameters to configure a syslog destination (either the MergePoint SP manager console or rootuser or a syslog server name that has been added using the **add** syslog destination <syslog_server_name> command). **Synopsis:** set syslog [destination<dest> enable <yes|no> type <type> usertty <username> tcp <ip> udp <ip> file <file name> pipe <name> template <num> **Example:** set syslog destination dest1 enable yes type tcp tcp 127.2.2.2 **NOTE:** See the add command for the following second level syslog parameter: *destination* on page 130.
syslog filter	Use the **set syslog filter** command to enable a syslog filter level. **Synopsis:** set syslog filter sysfilter|webfilter level <emerg|alert|crit|err|warn|notice|info|debug <yes | no> **Example:** set syslog filter sysfilter level emerg no alert no err yes notice yes
syslog presets	Use the **set syslog presets** command to set yes or no for enabling syslog to the root user or console. **Synopsis:** set syslog presets rootuser|console <yes|no> **Example:** set syslog presets rootuser yes console yes
timezone	Use the **set timezone** command to specify the timezone using a file relative to /etc/timezone.conf, for example GMT+8. **Synopsis:** set timezone <timezone> **Example:** set timezone GMT+5

Parameter	Command
tcpdump source-ip|source-port|destination-ip|destination-port|protocol|interface	Use the **set tcpdump** command to define the IP packge filter parameters for the debug. **Synopsis:** set tcpdump source-ip <source_iP> source-port <source_port> destination-ip <destination_ip> destination-port <destination_IP> protocol <any|ip|tcp|udp|icmp|igmp> interface <interface> **Example:** set tcpdump source-ip 1.1.1.1 source-port 1500 destination-ip 1.1.1.49 destination-port 1500 protocol ip interface eth0 **NOTE:** For the MergePoint SP5x00 manager, the interface is all, eth0 or eth1. For the MergePoint SP5x24/SP5x40 manager, the interface is all, eth0, eth1, priv0, bond0 or br0.
tcpdump state	Use the **set tcpdump** command to start or stop the debug. **Synopsis:** set tcpdump state on|off **Example:** set tcpdump state on **NOTE:** Setting the state to on or off will start or stop the tracing process.

CHAPTER 8

Using SMASH Command Line Protocol

The command line management option described in this chapter is based on the System Management Architecture for Server Hardware (SMASH) Command Line Protocol (CLP) specification developed by the Distributed Management Task Force (DMTF).

NOTE: The information in this chapter applies only to the MergePoint SP53xx manager.

SMASH CLP is an alternative to the web interface or CLI. This chapter provides information needed by users and administrators either to execute individual commands on the command line or to create scripts to automate management of managed servers.

Commands or scripts can be executed over either a Telnet or Secure Shell (SSH) version 2 session launched from a remote computer to the MergePoint SP manager. SSHv2 is recommended as a more secure access method than Telnet because it is encrypted.

The commands can be used to do the following:

- Perform some types of configuration, such as changing passwords on already-existing user accounts, and changing configuration of already-added devices that are managed by the MergePoint SP manager.
- Perform tasks using service processor capabilities on managed servers, such as controlling power, monitoring sensors and system events, and accessing the system console either at the level of the server's operating system or its BIOS.

The MergePoint SP manager is the industry's first management appliance to implement a command line management option that is based on and conforms to the CLP specification. This chapter introduces the SMASH CLP specification and describes the subset of the SMASH CLP commands that are provided on the MergePoint SP manager.

NOTE: Visit http://www.dmtf.org for the SMASH/CLP specification for more information about the SMASH CLP specification.

SMASH CLP Overview

The SMASH CLP is an open standard defining a lightweight protocol for using the command line to perform out of band management of heterogeneous servers. The CLP is intended for accessing services provided by service processors for power management, monitoring of sensors and of system event logs (SEL) and controlling managed servers' chassis and is suitable for scripting environments.

The CLP does not provide complete BIOS and operating system management, but the available text console (serial console) functionality provides a text interface to the server BIOS and operating system for the execution of commands and scripts. The CLP includes support for Secure Shell (SSH) and Telnet.

SMASH CLP also includes a direct mapping to a subset of the common information model (CIM) schema.

SMASH CLP implementation

Because CIM server implementations are not generally available in servers that are shipping today, the MergePoint SP manager's implementation of the SMASH CLP provides a virtualized CIM environment that manages interfaces that are not based on CIM.

Each of these embedded technologies provides different levels of capability and different presentations of the management interface. To provide a consistent standards-based interface to manage and interact with the underlying systems, the MergePoint SP manager translates the user's SMASH CLP commands into the proprietary server vendor commands and performs the specified actions. The SMASH CLP commands make it possible for a user or programmer to write one script to manage server hardware from multiple vendors.

The MergePoint SP manager's implementation provides command completion (using the Tab key), command history and command line editing (using the arrow and backspace keys), which are features outside the scope of the protocol.

The MergePoint SP manager supports several OEM extensions not currently defined in the CLP profile. For example, the /admin1/map1/oemavocent_discoverysap1 target was implemented to support the automatic discovery of managed servers.

The commands supported on the MergePoint SP manager can be used to perform the actions shown in the following table for each service processor type.

Table 8.1: Actions Supported for Each Server Type

Action	Where Documented
Control power	*Managing power or rebooting a managed server* on page 165
Access redirected console data (SoL)	*Showing console redirection to an service processor* on page 166
View system event logs (SEL)	*Viewing system event logs for managed servers* on page 167
Check sensors	*Checking sensors on managed servers* on page 165
Check fans	*Checking fans on managed servers* on page 166

For more information, see *Server commands* on page 163.

In addition, commands can be used to manage certain parameters of the MergePoint SP manager itself, see *MergePoint SP appliance commands* on page 157 for more details.

Supported profiles

The MergePoint SP manager supports a variety of profiles, including:

- CLP Service Profile
- SM CLP Admin Domain Profile
- SMASH Collection Profile
- Power State Management Profile
- Base Server Profile
- Computer System Profile
- Profile Registration Profile
- Text Console Redirection Profile
- Sensor Profile
- Record Log Profile
- Fan Profile
- IP Interface Profile
- Ethernet Port Profile
- SSH Service Profile
- Telnet Service Profile

- Chassis Manager Profile
- Alarm Device Profile
- Indicator LED Profile
- DHCP Client Profile
- DNS Client Profile
- Simply Identity Management Profile
- Role Based Authorization Profile
- Software Inventory Profile
- Software Update Profile
- Indications Profile
- Host LAN Network Port Profile
- CPU Profile
- System Memory Profile

For a complete list of supported service processors, see the MergePoint SP manager release notes.

Terms

This section defines CLP-specific terms used in this guide.

The CLP specifies the syntax and semantics used to manipulate *managed elements* (MEs), which are specified as *Targets* in CLP commands. See *Targets* on page 154 for the managed elements supported by the MergePoint SP manager.

The CLP command response protocol allows a text command message to be transmitted from the client over the transport protocol to the Manageability Access Point (MAP), which in this implementation is within the MergePoint SP manager. The MAP receives the command, processes it and sends a response back to the client.

Users can specify one of three output formats that are supported in the MergePoint SP manager: text, clpxml and keyword. The text format is the default. The other two output formats are structured to support automatic parsing by customer-created scripts: clpxml output is in XML format; keyword output is in the form of keyword/value pairs separated with the end-of-line characters.

The CLP targets are structured in a tree format with the root node /admin1 at the top and the map1 node representing the MAP itself. Within the MAP, systems are represented as individual

leaf nodes, and operations and attributes of each system are further displayed as nested leaf nodes under each corresponding system.

Actions can be performed by entering the name of a specific target (for example, “system1”) or of a group of targets by using a wildcard (for example, “system*”).

Some command verbs have implicit command targets (ICTs) defined as part of the verb. When the verb does not have an ICT, the CDT environment variable is used by the command processor to determine the target for a command.

The CD verb is used to navigate the CLP tree like a directory structure.

Explicit targets may be specified with full (absolute) or partial (relative) target names. An absolute name is referred to as an absolute target address (ATA). ATAs identify the target by specifying its full pathname from the root node. For example, /admin1/system1/log1 is an ATA.

A relative name is referred to as a relative target address (RTA). RTAs identify the target in the context of the current location in the tree. For example, the following RTA when entered at the /admin1/system1 location, goes up one level and then down two levels to access log1 under system2: **../system2/log1**.

General command syntax

The general syntax for commands is shown in the following line:

```
verb [options] [target] [properties]
```

The following line is an example of a verb followed by a target (/admin1/system1/textredirectsap1) and a property followed by a value (name).

```
-> show /admin1/system1/textredirectsap1 name
```

The terms used in commands are defined in the following table.

Table 8.2: Terms Used in Commands

Variable	Definition
verb	Specifies the action, which either provides information about the target or changes the state of the target. Always entered first on the command line. Only one verb can be specified in each command line. For example, entering show retrieves information about the target.
options	Specifies the modification to be made to the default behavior of the verb. None, one or more may be specified. Typically, options either modify output format or specify that the verb applies to nested levels. For example, entering -all with the show command example shows the OEM properties.

Variable	Definition
target	Specifies an ME to be affected by a verb. Every verb acts on one target. A target may be implicitly defined either as part of the verb as an IDT, by a CDT with or without an RTA or it may be explicitly defined on the command line as an ATA, as in /admin1/system1/textredirectsap1, which identifies the target textredirectsap1 ME in system1. A target can be an individual ME or a collection of MEs supported by the MAP, such as a system. See *Targets* on page 154 for the supported targets. Only one target term may be specified in each command line.
properties	Specify a specified attribute of the target to either be displayed (using the show verb) or modified (using the set verb). For example, when entered with show /admin1/system1/textredirectsap1, the name command shows the name property of the text console of system1. None, one or more may be specified.

Targets

The following table shows the target map for the MergePoint SP manager. To find detailed information about individual targets, see *Viewing targets, properties and commands for a target* on page 156.

Table 8.3: Map of Targets and Descriptions

Targets	Description
/admin1	The top level admin domain.
/admin1/map1	The MergePoint SP manager itself. For an example procedure using this target, see *To reset the MergePoint SP manager:* on page 159.
/admin1/map1/clpsvc1/clpendpt[n]	A CLP session on MergePoint SP manager. For an example procedure using this target, see *To change a session's output format:* on page 162.
/admin1/map1/enetport1	Ethernet port of MergePoint SP manager. For an example procedure using this target, see *MergePoint SP appliance commands* on page 157.
/admin1/map1/group[n]	The user group management. For an example procedure using this target, see *To manage a user group:* on page 161.
/admin1/map1/hostgroup[n]	The server group management. For an example procedure using this target, see *To manage a server group:* on page 161.

Targets	Description
/admin1/map1/ipendpt1	IP address of MergePoint SP manager. For an example procedure using this target, see *MergePoint SP appliance commands* on page 157.
/admin1/map1/nodemanagesvc1	The servers on the side navigation bar. For an example procedure using this target, see *To add a server to the side navigation bar:* on page 160.
/admin1/map1/oemavocent_ discoverysap1	The automatic discovery service access points (IP address range for the IP addresses of the service processors). For an example procedure using this target, see *To configure automatic discovery:* on page 159.
/admin1/map1/sshsvc1	The SSH service on the appliance. For an example procedure using this target, see *MergePoint SP appliance commands* on page 157.
/admin1/map1/swid[n]	To upgrade the appliance and roll back to the previous version. For an example procedure using this target, see *To upgrade MergePoint SP manager firmware:* on page 162 and see *To roll back the firmware to a defined version:* on page 162.
/admin1/map1/telnetsvc1	The Telnet service on the appliance. For an example procedure using this target, see *MergePoint SP appliance commands* on page 157.
/admin1/system[n]	The managed servers. For an example procedure using this target, see *To reset a managed server:* on page 165.
/admin1/system[n]/fan[n]	A managed server's hardware fans. For an example procedure using this target, see *To check fan data on an managed server:* on page 166.
/admin1/system[n]/log1/record[n]	A managed server's event log records. For an example procedure using this target, see *To manage system event logs on a managed server:* on page 168.
/admin1/system[n]/sensor[n]	A managed server's hardware sensors. For an example procedure using this target, see *To check sensor data on an managed server:* on page 165.
/admin1/system1/textredirectsap[n]	The console redirection service. For an example procedure using this target, see *To start a console redirection to an service processor:* on page 166.

Starting a SMASH CLP session

To start a SMASH CLP session, start an SSH session and then enter the **clp** command.

To start a SMASH CLP session:

1. Start an SSH session. See *Using SSH with the MergePoint SP Manager* on page 104.

2. Enter the **clp** command.
3. The SMASH CLP command line is displayed and you can now enter any CLP command.

Example

```
root@MergePoint:~# clp
Avocent SMASH-CLP Application (1.5.0.0)
/admin-> exit
CLP Session End
root@MergePoint:~# _
```

- The root@MergePoint> line is the SSH prompt. clp is the commmand entered.
- The /admin-> line is the CLP prompt.
- The exit line is a CLP command to exit the CLP command line.
- Then the original SSH prompt is displayed.

To exit a SMASH CLP session:

To exit the CLP command prompt, type **exit**.

Using Commands

The sections listed below provide procedures that illustrate the types of configuration that can be performed using the supported commands.

Viewing targets, properties and commands for a target

Entering the show command at each level of the map shows the targets at that level, the properties for the current target and the supported commands. Once you learn the supported commands and properties for any target, you can use the commands to view or change target properties. You can specify the target in either the form of the CDT that is currently in effect or as an ATA or an RTA. See *Terms* on page 152.

Setting properties on a target

On any target that supports the set command, you can set properties by entering the set command followed by the target, followed by the name of the property and the desired value, in the form: property=value.

NOTE: The dot (.) and the space are reserved. When specifying an IP address or a string with spaces in it, make sure to surround the value with quotes. For example, enter an IP address as “172.26.31.68” and a caption as “Brisbane office.”

To set a property of a target:

Enter the set command, followed by the target name, followed by the name of the property and the desired value, in the form: property=value.

The following command line sets the output format of a CLP session to text on the MergePoint SP manager.

```
-> set /admin1/map1/clpsvc1/clpendpt61 outputformat=text
```

Associations

MergePoint SP manager CLP supports associations. The association separator "=>" is used to address association instances.

To obtain the associations:

Enter the desired target level and type the show command, followed by “=>”, followed by an association instance.

For example, to obtain the association of /admin1/map1/clpsvc1 target, enter the following command:

```
/admin1-> cd /admin1/map1/clpsvc1
/admin1/map1/clpsvc1
/admin1/map1/clpsvc1-> show =>hostedservice
/admin1/map1/clpsvc1
associations
hostedservice :
Antecedent = /admin1/map1
Dependent = /admin1/map1/clpsvc1
```

MergePoint SP appliance commands

You can manage the MergePoint SP appliance using the **/admin1/map1** CLP command. See the following examples.

For an explanation of the terms "target" and "association," used in the following examples, see *Targets* on page 154 and *Associations* on page 157.

Showing the IP address of MergePoint SP manager

To display the IP address for either interface of the MergePoint SP manager, use a target of **/admin/map1/ipendpt1** or **/admin/map1/ipendpt2**.

Example:

```
/admin1-> show /map1/ipendpt1 IPv4Address
/map1/ipendpt1
```

```
properties
IPv4Address = 172.26.25.164
/admin1-> show /map1/ipendpt1 IPv6Address
/map1/ipendpt1
properties
IPv6Address = 2001:ac1a:11:3:230:48ff:fe85:edd4/64
```

Showing the ethernet port of MergePoint SP manager

To display the ethernet port of MergePoint SP manager, use a target of **/admin/map1/enetport1**, followed by the port number.

Example:

```
/admin1-> show /map1/enetport1 PortNumber
/map1/enetport1
properties
PortNumber = 0
subtargets
```

Showing Telnet and SSH services on the MergePoint SP manager

To display the Telnet service on the appliance, use a target of **/admin/map1/telnetsvc1** and an association of **/admin1/map1/tcpendpt2**.

To display the SSH service on the appliance, use a target of **/admin/map1/sshsvc1** and an association of **/admin1/map1/tcpendpt1 .**

Examples

The following example shows the idle time-out for the SSH service.

```
/admin1-> show /map1/sshsvc1/sshsetting1 idletimeout
/admin1/map1/sshsvc1/sshsetting1
properties
IdleTimeout = 18000
```

The following example shows the port number for the Telnet service.

```
/admin1-> show /map1/tcpendpt2 portnumber
/admin1/map1/tcpendpt2
properties
PortNumber = 23
```

Configuring automatic discovery of supported server types

The **admin1/map1/oemavocent_discoverysap1** target is for the automatic discovery service.

This service locates servers that have supported service processors when the IP addresses for the SPs are within the defined IP address range. You can set two different ranges of IP addresses for automatic discovery through the targets **oemavocent_startip** and **oemavocent_endip**. Supported commands are: **set properties**, **start** and **stop**. To see all the properties, run:

```
/admin1/-> show -all /map1/oemavocent_discoverysap1
```

NOTE: The **-all** option is for both "oem" and showing the associations of targets.

To configure automatic discovery:

1. Configure the automatic discovery range by entering the **set** command, followed by the target followed by oemavocent_startip=”startip” oemavocent_endip=”endip”.

   ```
   /admin1-> set /map1/oemavocent_discoverysap1 oemavocent_
   startip=”172.26.25.1” oemavocent_endip=”172.26.25.100”
   oemavocent_startip=172.26.25.1
   oemavocent_endip=172.26.25.100
   ```

2. Set the start mode of automatic discovery by entering the **set** command followed by the target.

   ```
   /admin1-> set /map1/oemavocent_discoverysap1 oemavocent_
   startmode=”manual”
   ```

NOTE: The valid oemavocent_startmode values are “automatic” and “manual”.

3. Disable the discovery service by entering the **stop** command followed by the target.

   ```
   /admin1-> stop /map1/oemavocent_discoverysap1
   /map1/oemavocent_discoverysap1 stopped at Sun Feb 3 18:48:21 2008
   ```

4. Enable the discovery service by entering the **start** command followed by the target.

   ```
   /admin1-> start /map1/oemavocent_discoverysap1
   /map1/oemavocent_discoverysap1 started at Sun Feb 3 14:47:46 2008
   ```

Managing power on the MergePoint SP manager

To manage power on the MergePoint SP manager, enter the **stop** or **reset** command with the MergePoint SP manager target: **/admin1/map1**.

To turn off the MergePoint SP manager:

Turn off the MergePoint SP manager by entering the **stop** command, followed by the target.

```
/admin1-> stop /map1
```

To reset the MergePoint SP manager:

Reset the MergePoint SP manager by entering the **reset** command, followed by the target.

```
/admin1-> reset /map1
```

Managing servers on the side navigation bar

The **/admin1/map1/nodemanagesvc1** target is for managing the servers on the side navigation bar of MergePoint SP manager. The **/admin1/map1 target** is associated with **/admin1/map1/nodemanagesvc1 target**. You can add a server and delete a server from the side navigation bar. Supported commands are: **create** and **delete**.

To add a server to the side navigation bar:

Enter the **create** command with OtherIdentifyingInfo property: **create system* OtherIdentifyingInfo="user,passwd,ip,alias,kg,databuf,sptype"**

For example, to add server 172.26.25.64 with the username **root** and password **calvin**:

```
/admin1-> create system*
OtherIdentifyingInfo="root,calvin,172.26.25.64,test,,0,3"
```

NOTE: The valid "sptype" value and the service processor type which it stands for are:
sptype = 1 means IPMI
sptype = 2 means iLO
sptype =3 means DRAC
sptype = 4 means HP IPMI
sptype = 6 means DRAC/MC
sptype = 7 means IBM BladeCenter
sptype = 8 means SPs which can only be access by the Telnet or SSH
sptype = 9 means ILOM
sptype = 10 means RSAII
sptype = 12 means HPBladeSystem

To set an unmanaged server as a managed server:

Enter the **set** command with OtherIdentifyingInfo property: set system[n] OtherIdentifyingInfo="user,passwd, ,alias,kg,databuf,sptype"

For example, to add server 172.26.26.16 with the username **USERID** and password **PASSW0RD**:

```
/admin1-> set system43 OtherIdentifyingInfo="USERID,PASSW0RD, ,test,,0,7"
```

To delete a server from the side navigation bar:

Delete a managed server by entering **delete** followed by the **/admin1/system[n]** target.

```
/admin1-> delete system1
/admin1/system1 deleted
```

Managing group servers

The **admin1/map1/hostgroup1** target is for grouping servers. You can create a group and add/remove managed servers into an existing group. Supported commands are: **create**, **set** and **delete**.

To manage a server group:

1. Create a server group on the MergePoint SP manager.

```
/admin1/map1-> create hostgroup* name=group_aa
/admin1/map1/hostgroup2
name=hostgroup_aa
```

2. Add a managed server to an existing server group.

```
/admin1/map1-> cd hostgroup2
/admin1/map1/hostgroup2-> set member="+/admin1/system4"
member=/admin1/system4
```

3. Remove a managed server from an existing server group.

```
/admin1/map1/hostgroup2-> set member="-/admin1/system4"
```

4. Delete an existing server group.

```
/admin1/map1/hostgroup2-> delete
/admin1/map1/hostgroup2 deleted
```

Managing user groups

The **admin1/map1/group[n]** target is for managing group users. You can show or delete an existing group. Supported commands are: **show** and **delete**.

To manage a user group:

1. Show an existing user group on the MergePoint SP manager.

```
/admin1/map1-> show group2
/admin1/map1/group2
properties
CreationClassName = Avct_Group
Name = user_gp1
ElementName = local:group.user_gp1
verbs
cd
delete
show
subtargets
```

2. Delete an exising user group.

```
/admin1/map1/group2-> delete
/admin1/map1/group2 deleted
```

Managing CLP sessions

The **/admin1/map1/clpsvc1/clpendpt[n]** target is for managing sessions. You can set a variety of properties, such as "output format." Supported commands are **set** and **show**.

To change a session's output format:

Enter the **set** command followed by the target and outputformat.

```
/admin1-> set /map1/clpsvc1/clpendpt61 outputformat=clpxml
```

Upgrading or rolling back the MergePoint SP manager firmware

The **/admin1/map1/swid[n]** target is for upgrading or rolling back the MergePoing SP manager firmware. You can load a source file to swid[n] target from an FTP address for upgrading and set a swid target as the firmware version to roll back to. Supported commands are **set** and **load**.

To upgrade MergePoint SP manager firmware:

Enter the **load** command with the FTP download address of the upgrading file to load the source file to swid[n]. Then MergePoint SP manager restarts automatically with the upgraded firmware.

```
/admin1/map1/swid[n]-> load -source FTPaddress
```

NOTE: Use <ftp://myserver.com/softwares/firmware.img> as the FTP address format.

To roll back the firmware to a defined version:

Enter the **set** command with the **isnext=true** property to set the rolling back firmware version. For the defined firmware to take effect, you must manually restart the MergePoint SP manager.

```
/admin1/map1/swid[n]-> set isnext=true
```

For example, the swid1 is the current firmware. You want to set the rolling back firmware to swid2.

```
/admin1/map1/swid1-> show
/admin1/map1/swid1
properties
InstanceID = Avct_MergePoint:swid1
isinstalled = true
IsEntity = true
iscurrent = true
isnext = true
verbs
cd
load
set
```

```
show
subtargets
```

NOTE: For swid1, iscurrent=true and isnext=true.

```
/admin1/map1/swid2-> set isnext=true
isnext=true
/admin1/map1/swid2-> show
/admin1/map1/swid2
properties
InstanceID = Avct_MergePoint:swid2
isnext = true
isinstalled = true
IsEntity = true
iscurrent = false
verbs
cd
load
set
show
subtargets
```

NOTE: The values isnext=true and iscurrent=false on swid2 indicate that the roll back version of the firmware is set to swid2. The MergePoint SP manager will restart with firmware swid2 automatically.

```
/admin1/map1/swid2-> show
/admin1/map1/swid2
properties
InstanceID = Avct_MergePoint:swid2
isnext = true
isinstalled = true
IsEntity = true
iscurrent = true
verbs
cd
load
set
show
subtargets
```

NOTE: After rolling back with swid2, iscurrent and isnext are true.

Server commands

Managed servers are managed with the /admin1/system[n] target.

You can begin managing servers after a server has been added under the Units tab in the web interface and a target exists in the map.

Showing the properties of a managed server

The /admin/system[n] target is the service processor on the managed server. You can view the service processor's IP address, name and other properties. The /admin/system[n]/memberofcollection target is the association of /admin/system[n]. With the association, you can find in which group the target is in.

To view the properties of a managed server:

1. To view the service processor's IP address, enter the show command followed by the /admin/system[n] target.

```
/admin1-> show /system3 OtherIdentifyingInfo
/admin1/system3
properties
OtherIdentifyingInfo[0] =
OtherIdentifyingInfo[1] = ******
OtherIdentifyingInfo[2] = 172.26.26.172
OtherIdentifyingInfo[3] = Unmanaged
OtherIdentifyingInfo[4] = 3
subtargets
textredirectsap1
textredirectsap2
textredirectsap3
textredirectsap4
sp1
```

2. To view one of the supported properties for the IP end point, enter the show command followed by the /admin/system[n] target followed by property.

```
/admin1-> show /system3 name
/system3
properties
Name = 172.26.25.122
subtargets
textredirectsap1
textredirectsap2
textredirectsap3
textredirectsap4
sp1
```

Managing power or rebooting a managed server

Manage power or reboot a managed server by entering either stop, reset or start with the /admin1/system[n] target.

To power off a managed server:

Enter the stop command followed by the target name for the managed server.

```
/admin1-> stop /system2
```

To reset a managed server:

Enter the reset command followed by the target name for the managed server.

```
/admin1-> reset /system3
```

To start a managed server:

Enter the start command followed by the target name for the managed server.

```
/admin1-> start /system3
```

Checking sensors on managed servers

You can check sensor data on managed servers using the show command with the /admin1/system[n]/sensor[n] target.

To check sensor data on an managed server:

Enter the show command followed by the /admin1/system[n]/sensor[n] target.

```
/admin1-> show /system3/sensor1
/system3/sensor1
properties
SystemName = 172.26.25.122
OperationalStatus =
RequestedState = 5 (No Change)
EnabledState = 5 (Not Applicable)
HealthState = 0 (Unknown)
ElementName = ROMB Battery
CurrentState = N/A
SensorType = 3 (Voltage)
PossibleStates =
CreationClassName = AVCT_DiscreteSensor
SystemCreationClassName = 172.26.25.122:AVCT_DiscreteSensor
DeviceID = 32:0:17
verbs
cd
```

```
show
subtargets
```

Checking fans on managed servers

You can check fan data on managed servers using the show command with the /admin1/system[n]/fan[n] target.

To check fan data on an managed server:

Enter the show command followed by the /admin1/system[n]/fan[n] target.

```
/admin1-> show /system3/fan1
/system3/fan1
properties
CreationClassName = AVCT_Fan
SystemName = 172.26.25.122
SystemCreationClassName = 172.26.25.122:AVCT_Fan
DeviceID = 32:0:48
RequestedState = 5 (No Change)
ActiveCooling = true
EnabledState = 5 (Not Applicable)
HealthState = 0 (Unknown)
OperationalStatus =
VariableSpeed = false
ElementName = FAN 1A RPM
DesiredSpeed = 0
verbs
cd
show
subtargets
```

Showing console redirection to an service processor

The target for the console of the service processor on a managed server is: /admin1/system1/textredirectsap[n]. Supported commands are show, start and stop.

To start a console redirection to an service processor:

Enter the start command followed by /admin1/system1/textredirectsap[n].

```
/admin1/system1-> start textredirectsap1

Booting 'Red Hat Enterprise Linux ES (2.6.9-5.ELsmp)'

root (hd0,1)
```

```
Filesystem type is ext2fs, partition type 0x83
kernel /vmlinuz-2.6.9-5.ELsmp ro root=LABEL=/ rhgb quiet
[Linux-bzImage, setup=0x1400, size=0x15492c]
initrd /initrd-2.6.9-5.ELsmp.img
[Linux-initrd @ 0x37f7a000, 0x75d08 bytes]

ATI9
Red Hat Enterprise Linux ES release 4 (Nahant)
Kernel 2.6.9-5.ELsmp on an i686

localhost.localdomain login: stop
Password: Login timed out after 60 seconds

Red Hat Enterprise Linux ES release 4 (Nahant)
Kernel 2.6.9-5.ELsmp on an i686

localhost.localdomain login: The server is not powered on. The Virtual
Serial
Port is not available.
```

To stop a console redirection to an service processor:

Enter 4 "+" key on the console screen to exit the console.

```
/admin1/system1/textredirectsap1 started at Fri Feb 22 08:01:15 2008

/admin1/system1->
```

To view session terminate sequence:

Enter the show command followed by /admin1/system1/textredirectsap[n].

```
/admin1/-> show /system1/textredirectsap[n]
```

Viewing system event logs for managed servers

The target for accessing system event logs (SELs) on managed servers is: /admin1/system[n]/log1. Supported commands are show and delete.

View information about all system event logs, including the number of records, by entering show, followed by the target name.

To manage system event logs on a managed server:

1. Enter the show command followed by the /admin1/system[n]/log1 target to show the records and properties of system event logs for system1.

```
/admin1-> show /system3/log1
/admin1/system3/log1
properties
MaxNumberOfRecords = 512
ElementName = IPMI SEL
OperationalStatus =
HealthState = 0 (Unknown)
EnabledState = 2 (Enabled)
RequestedState = 5 (No Change)
InstanceID = 172.26.25.122
verbs
cd
show
subtargets
record1
record2
record3
record4
record5
```

2. Enter the show command followed by the /admin1/system[n]/log1/record[n] target to show the records information of system event logs for system1.

```
/admin1-> show /system3/log1/record1
/admin1/system3/log1/record1
properties
RecordData = *Power Unit*19650720061816.881664+000*Sys pwr monitor*Power
ycle*
InstanceID = 172.26.25.122:1
LogName = IPMI SEL
RecordID = 1
CreationTimeStamp = NULL
LogInstanceID = 172.26.25.122
ElementName = IPMI SEL Record
RecordFormat = *string Type*datetime DateTime*string Source*string
Description*
verbs
```

```
cd
show
delete
subtargets
```

3. Delete all records by entering the delete command followed by the /admin1/system3/log1/record* target name.

NOTE: Deletion of individual records is not supported.

The following delete command deletes all records under log1

```
/admin1-> delete /system3/log1/record*
```

CHAPTER 9

Using WS-Management

NOTE: The information in this chapter applies only to the MergePoint SP53xx manager.

As an alternative to the web interface, CLI or CLP, the Web Services Management (WS-MAN) service can be used to remotely manage the MergePoint SP manager and connected service processors.

WS-MAN commands for the MergePoint SP manager can be entered using a WS-MAN client such as Microsoft's WinRM or the Openwsman CLI. The client is launched from a remote server and connects to the MergePoint SP manager.

Software requirements for WinRM

- Visit http://www.microsoft.com to download the WinRM client.
- Configure the security permissions for the WinRM client on your computer.

Software requirements for Openwsman CLI

- Visit http://www.openwsman.org/project/wsmancli to download the Openwsman and wsmancli files.
- Compile and install the Openwsman and wsmancli files on your computer.

NOTE: Visit http://www.dmtf.org/standards/wbem/ for more information about the WS-MAN specification.

WS-MAN configuration

The following settings are required for configuring a WS-MAN client:

- Namespace: http://sblim.sf.net/wbem/wscim/1/cim-schema/2
- Port: 8889
- Username/Password: A MergePoint SP manager user account, for example: admin/admin

Automatic Discovery Management

AvctMP_DiscoveryService

This class manages the process that controls discovery searches. It inherits from CIM_Service and also defines the following members.

Properties

`oemavocent_discoveryinterval`

The period between automatic discovery searches, in seconds.

Data type: String

Access type: Read/Write

Qualifiers: 5 to 65535

Methods

`Start`

Starts the discovery service.

Arguments: None

Return Type: Integer

Return Value:

0 Command OK

1 Service is not started

2 Service is already stopped

3 Internal error

`Stop`

Stops the discovery service.

Arguments: None

Return Type: Integer

Return Value:

0 Command OK

1 Service is not started

2 Service is already started

3 Internal error

AvctMP_DiscoverySAP

This class manages a discovery search for connected service processors on a specified IP address range. There are two instances of this class because the MergePoint SP manager supports two independent search ranges. The discovery search can be set to start automatically based on a time interval or started manually by the user. The class inherits from CIM_ServiceAccessPoint and also defines the following members.

Properties

`oemavocent_startip`

The IP address defining the start of the address range.

Data type: String

Access type: Read / Write

Qualifiers: A valid numerical IP address.

`oemavocent_endip`

The IP address defining the end of the address range.

Data type: String

Access type: Read / Write

Qualifiers: A valid numerical IP address. Must be greater than or equal to the start IP address.

`oemavocent_startmode`

The start mode (automatic or manual) for this search range.

Data type: String

Access type: Read / Write

Qualifiers: Must be "manual" or "automatic"

Methods

`Start`

This function is used to start discovery on the designated search range.

Arguments: None

Return Type: Integer

Return Value:

0 Command OK

1 Service is not started

2 Service is already stopped

3 Internal error

`Stop`

This function is used to stop discovery on the designated search range.

Arguments: None

Return Type: Integer

Return Value:

0 Command OK

1 Service is not started

2 Service is already stopped

3 Internal error

AvctMP_DiscoveryServiceAccessBySAP

This class defines the association between the discovery service and its service access points.

Examples

To list the available AvctMP_DiscoveryService instances:

Enter the following the command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoveryService -h <appliance_IPaddress> -u <username> -p <password> -y
basic
```

To get the AvctMP_DiscoveryService instances

Enter the following the command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoveryService?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoveryService",Name="OEM Avocent Discovery Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic ""
```

To set the discovery interval to 30 seconds:

Enter the following command:

```
wsman put http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoveryService?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoveryService",Name="OEM Avocent Discovery Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic -k oemavocent_
discoveryinterval=30
```

To start the automatic discovery service:

Enter the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoveryService?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoveryService",Name="OEM Avocent Discovery Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic -a start
```

To stop the automatic discovery service:

Enter the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoveryService?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoveryService",Name="OEM Avocent Discovery Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic -a stop
```

To list all available discovery search ranges:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP -h <appliance_IPaddress> -u <username> -p <password> -y
basic
```

To get discovery search range #1:

Enter the following command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point 1" -h
<appliance_IPaddress> -u <username> -p <password> -y basic
```

To modify the discovery search range:

Enter the following command:

```
wsman put http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point 1" -h
<appliance_IPaddress> -u <username> -p <password> -y basic -k
oemavocent_startip="172.26.25.63" -k oemavocent endip="172.26.25.65"
```

To set the start mode of search range #1 to manual:

Enter the following command:

```
wsman put http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point 1" -h
<appliance_IPaddress> -u <username> -p <password> -y basic -k
oemavocent_startmode="manual"
```

To start the discovery on search range #1:

Enter the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point 1" -h
<appliance_IPaddress> -u <username> -p <password> -y basic -a start
```

To stop the discovery on search range #2:

Enter the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point 2" -h
<appliance_IPaddress> -u <username> -p <password> -y basic -a stop
```

NOTE: If the automatic discovery is already stopped, then the return value is 2.

Power Management

AvctMP_PowerManagementService

This class controls the power state of the MergePoint SP manager. It inherits from CIM_ PowerManagementService.

AvctMP_PowerManagementCapabilities

This class defines the supported capabilities of the MergePoint SP manager power management service. It inherits from CIM_PowerManagementCapabilities.

AvctMP_AssociatedPowerManagementService

This class defines the association between a management service and the service processor. It inherits from CIM_AssociatedPowerManagementService.

AvctRT_PowerManagementService

This class controls the power state of connected service processors. It inherits from CIM_ PowerManagementService.

Methods

`RequestPowerStateChange`

Starts the discovery service.

Arguments:	ManagedElement	The target to control. Should be the same as the value of "name" in AvctRT_ ComputerSystem Instance
	PowerState	2 Power on 5 Soft power cycle 6 Hard power off 8 Soft power off
Return Type:	Integer	
Return Value:	0 Command OK 2 Internal error	

AvctRT_PowerManagementCapabilities

This class defines the supported capabilities of the power management service. It inherits from CIM_PowerManagementCapabilities.

AvctRT_AssociatedPowerManagementService

This class defines the association between a management service and the service processor. It inherits from CIM_AssociatedPowerManagementService.

Examples

To reboot the MergePoint SP manager:

Enter the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
PowerManagementService?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
PowerManagementService",Name="Power Management Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic -a
RequestPowerStateChange -k PowerState=5
```

To list available AvctRT_PowerManagementService instances:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctRT_
PowerManagementService -h <appliance_IPaddress> -u <username> -p
<password> -y basic
```

To get a specific AvctRT_PowerManagementService instance:

Enter the following command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctRT_
PowerManagementService?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="<instance name>",CreationClassName="AvctRT_
PowerManagementService",Name="Power Management Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic
```

To turn on a service processor:

Enter the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctRT_
PowerManagementService?SystemCreationClassName="AvctRT_
ComputerSystem",SystemName="<instance name>",CreationClassName="AvctRT_
PowerManagementService",Name="Power Management Service" -h <appliance_
IPaddress> -u <username> -p <password> -y basic -a
RequestPowerStateChange -k PowerState=2 -k ManagedElement="172.26.25.64"
```

NOTE: Use AvctRT_AssociatedPowerManagementService association with the instance of AvctRT_PowerManagementService to determine the instance of AvctRT_ComputerSystem - the desired managed server.

To enumerate AvctRT_PowerManagementCapabilities instances:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctRT_
PowerManagementCapabilities -h <appliance_IPaddress> -u <username> -p
<password> -y basic
```

To get a specific AvctRT_PowerManagementCapabilities instance:

Enter the following command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctRT_
PowerManagementCapabilities?InstanceID="<instance name>"-h <appliance_
IPaddress> -u <username> -p <password> -y basic
```

To enumerate AvctRT_AssociatedPowerManagementService associations:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctRT_
AssociatedPowerManagementService -h <appliance_IPaddress> -u <username>
-p <password> -y basic
```

Telnet and SSH Session Management

AvctMP_SSHProtocolService

This class manages the process that controls SSH connections. It inherits from CIM_ ProtocolService. There is only one instance of this class on the appliance.

AvctMP_TelnetProtocolService

This class manages the process that controls Telnet connections. It inherits from CIM_ ProtocolService. There is only one instance of this class on the appliance.

AvctMP_SSHProtocolEndpoint

This class manages the process that controls SSH connections. It inherits from CIM_ SSHProtocolEndpoint.

Enumerate this class to see details about active SSH connections on the MergePoint SP manager. SSH connections can be closed by deleting the appropriate instance.

AvctMP_TelnetProtocolEndpoint

This class represents a telnet connection. It inherits from CIM_TelnetProtocolEndpoint.

Enumerate this class to see details about active telnet connections on the MergePoint SP manager. Telnet connections can be closed by deleting the appropriate instance.

AvctMP_SSHCapabilities

This class represents the capabilities of the SSH service. It inherits from CIM_SSHCapabilities.

Enumerate or query this class to see the supported features of the SSH service, such as versions and supported encryption algorithms.

AvctMP_TelnetCapabilities

This class represents the capabilities of the Telnet service. It inherits from CIM_ TelnetCapabilities.

Enumerate or query this class to see the supported features of the Telnet service such as supported terminal and character display modes.

AvctMP_SSHSettingData

This class represents the data settings for the SSH Service. It inherits from CIM_ SSHSettingData.

AvctMP_TelnetSettingData

This class represents the data settings for the Telnet service. It inherits from CIM_ TelnetSettingData.

AvctMP_SSHProvidesEndpoint

This class represents the association between the SSH service and the endpoints it provides. It inherits from CIM_ProvidesEndpoint.

AvctMP_TelnetProvidesEndpoint

This class represents the association between the Telnet service and the endpoints it provides. It inherits from CIM_ProvidesEndpoint.

AvctMP_SSHEndpointElementSettingData

This class represents the association between an SSH endpoint and its settings data. It inherits from CIM_ElementSettingData.

AvctMP_TelnetEndpointElementSettingData

This class represents the association between a telnet endpoint and its settings data. It inherits from CIM_ElementSettingData.

AvctMP_TCPProtocolEndpoint

This class represents an endpoint dedicated to the TCP protocol. It inherits from CIM_ TCPProtocolEndpoint.

AvctMP_ServiceAccessBySAP

This class represents the association between a service and the TCP endpoints it provides. It inherits from CIM_ServiceAccessbySAP.

Avct_ElementCapabilities

This class represents the association between managed elements and their capabilities. It inherits from CIM_ElementCapabilities.

AvctMP_ElementSettingData

This class represents the association between managed elements and their settings data. It inherits from CIM_ElementSettingData.

Avct_HostedService

This class represents a hosted service running on the MergePoint SP manager. It inherits from CIM_HostedService. It can be enumerated to name all managed services running on the appliance.

Examples

To list all active SSH connections:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
SSHProtocolEndpoint -h <appliance_IPaddress> -u <username> -p <password>
-y basic
```

To query a specific SSH connection:

Enter the following command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
SSHProtocolEndpoint?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
SSHProtocolEndpoint",Name="<selected_connection>" -h <appliance_
IPaddress> -u <username>
-p <password> -y basic
```

To disconnect an SSH connection:

Enter the following command:

```
wsman delete http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
SSHProtocolEndpoint?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
SSHProtocolEndpoint",Name="<selected_connection>" -h <appliance_
IPaddress> -u <username>
-p <password> -y basic
```

To view the status of the SSH Service:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
SSHProtocolService -h <appliance_IPaddress> -u <username> -p
<password> -y basic
```

To view features supported by the SSH Service:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
SSHCapabilities -h <appliance_IPaddress> -u <username> -p <password> -y
basic
```

To view the settings of the SSH Service:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
SSHSettingData -h <appliance_IPaddress> -u <username> -p <password> -y
basic
```

To list all active Telnet connections:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
TelnetProtocolEndpoint -h <appliance_IPaddress> -u <username> -p
<password> -y basic
```

To query a specific Telnet connection:

Enter the following command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
TelnetProtocolEndpoint?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
TelnetProtocolEndpoint",Name="<selected_connection>" -h <appliance_
IPaddress> -u
<username> -p <password> -y basic
```

To disconnect an active Telnet connection:

Enter the following command:

```
wsman delete http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
TelnetProtocolEndpoint? SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
TelnetProtocolEndpoint",Name="<selected_connection>" -h <appliance_
IPaddress> -u
<username> -p <password> -y basic
```

To view the status of the Telnet service:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
TelnetProtocolService -h <appliance_IPaddress> -u <username> -p
<password> -y basic
```

To view features supported by the Telnet service:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
TelnetCapabilities -h <appliance_IPaddress> -u <username> -p <password>
-y basic
```

To list all managed services:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/Avct_
HostedService -h <appliance_IPaddress> -u <username> -p <password> -y
basic
```

WinRM Examples

This section provides examples of controlling the MergePoint SP manager using the Microsoft WinRM client.

To view the current discovery search range settings:

Enter the following command:

```
winrm enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP -username:admin -password:admin -
r:192.168.96.210:8889/wsman -auth:basic
```

The following response is returned:

```
AvctMP_DiscoverySAP
    Caption
    CreationClassName = AvctMP_DiscoverySAP
    Description = null
    ElementName = map_discovery_sap
    EnabledDefault = 2
    EnabledState = 0
    HealthState = null
    InstallDate = null
    Name = OEM Avocent Discovery Service Access Point1
    OtherEnabledState = null
    RequestedState = 5
    Status = false
    SystemCreationClassName = AvctMP_ComputerSystem
    SystemName = MergePoint5300
    TimeOfLastStateChange = null
    oemavocent_endip
    oemavocent_startip
    oemavocent_startmode = 1(manual)
AvctMP_DiscoverySAP
    Caption
    CreationClassName = AvctMP_DiscoverySAP
    Description = null
    ElementName = map_discovery_sap
    EnabledDefault = 2
```

```
    EnabledState = 0
    HealthState = null
    InstallDate = null
    Name = OEM Avocent Discovery Service Access Point2
    OtherEnabledState = null
    RequestedState = 5
    Status = true
    SystemCreationClassName = AvctMP_ComputerSystem
    SystemName = MergePoint5300
    TimeOfLastStateChange = null
    oemavocent_endip = 192.168.96.70
    oemavocent_startip = 192.168.96.70
    oemavocent_startmode = 2(automatic)
```

To query discovery search range #1:

Enter the following command:

```
winrm get "http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName=AvctMP_
ComputerSystem+SystemName=MergePoint5300+CreationClassName=AvctMP_
DiscoverySAP+Name=OEM Avocent Discovery Serice Access Point1" -
username:admin -password:admin -r:192.168.96.210:8889/wsman -auth:basic
```

The following response is returned:

```
AvctMP_DiscoverySAP
    Caption
    CreationClassName = AvctMP_DiscoverySAP
    Description = null
    ElementName = map_discovery_sap
    EnabledDefault = 2
    EnabledState = 0
    HealthState = null
    InstallDate = null
    Name = OEM Avocent Discovery Service Access Point1
    OtherEnabledState = null
    RequestedState = 5
    Status = false
    SystemCreationClassName = AvctMP_ComputerSystem
    SystemName = MergePoint5300
    TimeOfLastStateChange = null
    oemavocent_endip
    oemavocent_startip
```

```
    oemavocent_startmode = 1(manual)
```

To modify the search range #1:

Set the search range to start a search from IP address 192.168.96.78 to 192.168.96.80 with automatic start mode by entering the following command:

```
winrm set "http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName=AvctMP_
ComputerSystem+SystemName=MergePoint5300+CreationClassName=AvctMP_
DiscoverySAP+Name=OEM Avocent Discovery Serice Access Point1" -
username:admin -password:admin -r:192.168.96.210:8889/wsman -auth:basic
@{oemavocent_startip="192.168.96.78";oemavocent_
endip="192.168.96.80";oemavocent_startmode="automatic"}
```

The following response is returned:

```
AvctMP_DiscoverySAP
    Caption
    CreationClassName = AvctMP_DiscoverySAP
    ElementName = map_discovery_sap
    EnabledDefault = 2
    EnabledState = 0
    Name = OEM Avocent Discovery Service Access Point1
    RequestedState = 5
    Status = false
    SystemCreationClassName = AvctMP_ComputerSystem
    SystemName = MergePoint5300
    oemavocent_endip = 192.168.96.80
    oemavocent_startip = 192.168.96.78
    oemavocent_startmode = automatic
```

To start discovery on search range #1:

Start the search by entering the following command:

```
winrm invoke start "http://sblim.sf.net/wbem/wscim/1/cim-
schema/2/AvctMP_DiscoverySAP?SystemCreationClassName=AvctMP_
ComputerSystem+SystemName=MergePoint5300+CreationClassName=AvctMP_
DiscoveryService+Name=OEM Avocent Discovery Service Access Point1" -
username:admin -password:admin -r:192.168.96.210:8889/wsman -auth:basic
```

The following response is returned:

```
start_OUTPUT
    ReturnValue = 0
```

Openwsman CLI Examples

This section provides examples of XML responses generated by running WS-MAN commands.

To view the current discovery search range settings:

Enter the following command:

```
wsman enumerate http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP -h 192.168.96.210 -u admin -p admin -y basic -o
-m 40
```

The following response is returned:

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:wsen="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
xmlns:n1="http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <s:Header>


<wsa:To>http:/-
/schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
<wsa:A-
ction>http://-
schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse</wsa:Action>
    <wsa:RelatesTo>uuid:69dbc95f-3968-43d4-adc8-
    bc4e006b3f49</wsa:RelatesTo>
    <wsa:MessageID>uuid:c8fb0eb1-4284-1442-8087-
    8bea0f86e000</wsa:MessageID>
  </s:Header>
  <s:Body>
    <wsen:EnumerateResponse>
        <wsman:Items>
            <n1:AvctMP_DiscoverySAP>
                <n1:Caption/>
                <n1:CreationClassName>AvctMP_
                DiscoverySAP</n1:CreationClassName>
                <n1:Description xsi:nil="true"/>
                <n1:ElementName>map_discovery_sap</n1:ElementName>
                <n1:EnabledDefault>2</n1:EnabledDefault>
                <n1:EnabledState>0</n1:EnabledState>
                <n1:HealthState xsi:nil="true"/>
```

```
            <n1:InstallDate xsi:nil="true"/>
            <n1:Name>OEM Avocent Discovery Serice Access
            Point1</n1:Name>
            <n1:OtherEnabledState xsi:nil="true"/>
            <n1:RequestedState>5</n1:RequestedState>
            <n1:Status>false</n1:Status>
<n1:SystemCreationClassName>AvctMP_
ComputerSystem</n1:SystemCreationClassName>
            <n1:SystemName>MergePoint5300</n1:SystemName>
            <n1:TimeOfLastStateChange xsi:nil="true"/>
            <n1:oemavocent_endip>192.168.96.80</n1:oemavocent_endip>
            <n1:oemavocent_startip>192.168.96.78</n1:oemavocent_
            startip>
            <n1:oemavocent_startmode>2(automatic)</n1:oemavocent_
            startmode>
        </n1:AvctMP_DiscoverySAP>
        <n1:AvctMP_DiscoverySAP>
            <n1:Caption/>
            <n1:CreationClassName>AvctMP_
            DiscoverySAP</n1:CreationClassName>
            <n1:Description xsi:nil="true"/>
            <n1:ElementName>map_discovery_
            sap</n1:ElementName>
            <n1:EnabledDefault>2</n1:EnabledDefault>
            <n1:EnabledState>0</n1:EnabledState>
            <n1:HealthState xsi:nil="true"/>
            <n1:InstallDate xsi:nil="true"/>
            <n1:Name>OEM Avocent Discovery Serice Access
            Point2</n1:Name>
            <n1:OtherEnabledState xsi:nil="true"/>
            <n1:RequestedState>5</n1:RequestedState>
            <n1:Status>false</n1:Status>

 <n1:SystemCreationClassName>AvctMP_
 ComputerSystem</n1:SystemCreationClassName>
            <n1:SystemName>MergePoint5300</n1:SystemName>
            <n1:TimeOfLastStateChange xsi:nil="true"/>
            <n1:oemavocent_endip>192.168.96.70</n1:oemavocent_endip>
            <n1:oemavocent_startip>192.168.96.70</n1:oemavocent_
            startip>
```

```
                <n1:oemavocent_startmode>2(automatic)</n1:oemavocent_
                startmode>
              </n1:AvctMP_DiscoverySAP>
            </wsman:Items>
            <wsen:EnumerationContext/>
            <wsman:EndOfSequence/>
        </wsen:EnumerateResponse>
    </s:Body>
</s:Envelope>
```

To query discovery search range #1:

Enter the following command:

```
wsman get http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point1" -h
192.168.96.210 -u admin -p admin -y basic
```

The following response is returned:

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:n1="http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <s:Header>

<wsa:To>http:/-
/schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>

<wsa:A-
ction>http://-
schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse</wsa:Action>
    <wsa:RelatesTo>uuid:a589fe9a-9764-4da3-90c2-
    8caad8ab5c68</wsa:RelatesTo>
    <wsa:MessageID>uuid:e74b53aa-4284-1442-8083-
    8bea0f86e000</wsa:MessageID>
  </s:Header>
  <s:Body>
    <n1:AvctMP_DiscoverySAP>
        <n1:Caption/>
        <n1:CreationClassName>AvctMP_DiscoverySAP</n1:CreationClassName>
        <n1:Description xsi:nil="true"/>
```

```
        <n1:ElementName>map_discovery_sap</n1:ElementName>
        <n1:EnabledDefault>2</n1:EnabledDefault>
        <n1:EnabledState>0</n1:EnabledState>
        <n1:HealthState xsi:nil="true"/>
        <n1:InstallDate xsi:nil="true"/>
        <n1:Name>OEM Avocent Discovery Serice Access Point1</n1:Name>
        <n1:OtherEnabledState xsi:nil="true"/>
        <n1:RequestedState>5</n1:RequestedState>
        <n1:Status>false</n1:Status>

<n1:SystemCreationClassName>AvctMP_
ComputerSystem</n1:SystemCreationClassName>
        <n1:SystemName>MergePoint5300</n1:SystemName>
        <n1:TimeOfLastStateChange xsi:nil="true"/>
        <n1:oemavocent_endip>192.168.96.80</n1:oemavocent_endip>
        <n1:oemavocent_startip>192.168.96.78</n1:oemavocent_startip>
        <n1:oemavocent_startmode>2(automatic)</n1:oemavocent_startmode>
    </n1:AvctMP_DiscoverySAP>
  </s:Body>
</s:Envelope>
```

To modify the search range #1:

To set the search range to start a search from IP address 192.168.96.78 to 192.168.96.80 with automatic start mode, enter the following command:

```
wsman put http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName=AvctMP_
ComputerSystem,SystemName=MergePoint5300,CreationClassName=AvctMP_
DiscoverySAP,Name="OEM Avocent Discovery Service Access Point1" -h
192.168.96.210 -u admin -p admin -y basic -k oemavocent_
discoveryinterval=30 -k oemavocent_startip=192.168.96.78 -k oemavocent_
endip=192.168.96.80
```

The following response is returned:

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:n1="http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP">
  <s:Header>
<wsa:To>http:/-
/schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
```

```
        <wsa:A-
        ction>http://-
        schemas.xmlsoap.org/ws/2004/09/transfer/PutResponse</wsa:Action>
        <wsa:RelatesTo>uuid:cf889227-6d70-471e-991e-
        35fd889ad3b1</wsa:RelatesTo>
        <wsa:MessageID>uuid:b601488f-4284-1442-807d-
        8bea0f86e000</wsa:MessageID>
</s:Header>
<s:Body>
    <n1:AvctMP_DiscoverySAP>
        <n1:Caption/>
        <n1:CreationClassName>AvctMP_DiscoverySAP</n1:CreationClassName>
        <n1:ElementName>map_discovery_sap</n1:ElementName>
        <n1:EnabledDefault>2</n1:EnabledDefault>
        <n1:EnabledState>0</n1:EnabledState>
        <n1:Name>OEM Avocent Discovery Service Access Point1</n1:Name>
        <n1:RequestedState>5</n1:RequestedState>
        <n1:Status>false</n1:Status>

<n1:SystemCreationClassName>AvctMP_
ComputerSystem</n1:SystemCreationClassName>
        <n1:SystemName>MergePoint5300</n1:SystemName>
        <n1:oemavocent_endip>192.168.96.80</n1:oemavocent_endip>
        <n1:oemavocent_startip>192.168.96.78</n1:oemavocent_startip>
        <n1:oemavocent_startmode>2(automatic)</n1:oemavocent_startmode>
    </n1:AvctMP_DiscoverySAP>
  </s:Body>
</s:Envelope>
```

To start discovery on search range #1:

Start the search by entering the following command:

```
wsman invoke http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP?SystemCreationClassName="AvctMP_
ComputerSystem",SystemName="MergePoint5300",CreationClassName="AvctMP_
DiscoverySAP",Name="OEM Avocent Discovery Service Access Point1" -h
192.168.96.210 -u admin -p admin -y basic -a start
```

The following response is returned:

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
```

```
xmlns:n1="http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
DiscoverySAP">
      <s:Header>

    <wsa:To>http:/-
    /schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
        <wsa:Action>http://sblim.sf.net/wbem/wscim/1/cim-schema/2/AvctMP_
        DiscoverySAP/startResponse</wsa:Action>
        <wsa:RelatesTo>uuid:4280acd3-3b5b-4b15-9103-
        e4484ab5c8da</wsa:RelatesTo>
        <wsa:MessageID>uuid:bb3639a1-4284-1442-807f-
        8bea0f86e000</wsa:MessageID>
      </s:Header>
      <s:Body>
        <n1:start_OUTPUT>
            <n1:ReturnValue>0</n1:ReturnValue>
        </n1:start_OUTPUT>
      </s:Body>
    </s:Envelope>
```

APPENDICES

Appendix A: Technical Support

Our Technical Support staff is ready to assist you with any installation or operational issues you encounter with your Avocent product. If an issue should develop, follow the steps below for the fastest possible service.

To resolve an issue:

1. Check the pertinent section of this manual to see if the issue can be resolved by following the procedures outlined.
2. Visit www.avocent.com/support and use one of the following resources:

   Search the knowledge base or use the online service request

   -or-

   Select *Technical Support Contacts* to find the Avocent Technical Support location nearest you.

Appendix B: Technical Specifications

Table B.1: MergePoint SP5x00 Manager Technical Specifications

Network Connection	
Number	2
Type	Ethernet, 10BaseT, 100BaseT, GigE
Connector	RJ-45
Serial Port	
Number	1
Type	RS-232 serial
Connector	DB9 male
Mechanical	
H x W x D	4.3 x 42.7 x 35.6 cm (1.7 x 16.8 x 14 in), 1 U form factor
Weight	5.9 kg (13 lb)
Power	
AC Input Voltage	100 to 240 VAC
Rated Input Current	4A maximum
Rated Input Frequency	50 to 60 Hz
Rated Output Power	260 W maximum
Rated Output Voltages	+3.3 V (15 A), +5 V (25 A), +12V (18A), -12 V (1A)
BTU Rate	1400 Bus/hour (for rated output power of 260 W)
Environmental	
Temperature	0° to 35° Celsius (32° to 95° Fahrenheit) operating
Humidity	10 to 90% noncondensing operating

Safety and EMC Approvals and Markings	USA (UL, FCC), Canada (cUL), Germany (TUV), European Union (CE), Japan (VCCI), Russia (GOST) and Korea (MIC)
Safety certifications and EMC certifications for this product are obtained under one or more of the following designations: CMN (Certification Model Number), MPN (Manufacturer's Part Number) or Sales Level Model designation. The designation that is referenced in the EMC and/or safety reports and certificates are printed on the label applied to this product.	

Table B.2: MergePoint 24/40 Manager Specifications

Hardware	
CPU	Freescale Power QUICC III
Memory	512 MB DDRAM/1 GB compact Flash
Interfaces	24/40 Ethernet 10/100 BT on RJ45
	1 RS232 console on RJ45
	1 RS232 DTE on RJ45 for power manager or external modem
	1 10/100/10000 BT Ethernet on RJ45 (primary)
	1 10/100 BT Ethernet on RJ45 (optional secondary or failover)
Dual 32/16 bit PCMCIA Slots:	Supported PC card types listed at www.avocent.com
Enclosure	1U Steel
Dimensions (WxDxH)	43.18 x 80 x 4.45 cm (17 x 12 x 1.75 in)
Environmental	
Operating Temperature	10° to 50° Celsius (50° to 122° Farenheit)
Storage Temperature	40° to 85° Celsius (40° to 185° Farenheit)
Humidity	5% to 90% noncondensing
Electrical	

Power	Universal AC: single or dual 100240 VAC, 50/60Hz, 1.4 A max Dual DC: 36 to 75 VDC, 5 A max
Safety and EMC Approvals and Markings	CSA, FCC, C-tick, Japan (VCCI), European Union (CE)

Safety certifications and EMC certifications for this product are obtained under one or more of the following designations: CMN (Certification Model Number), MPN (Manufacturer's Part Number) or Sales Level Model designation. The designation that is referenced in the EMC and/or safety reports and certificates are printed on the label applied to this product.

To comply with FCC and CE certification requirements, use shielded cables when connecting SPs to Ethernet ports. Failure to observe these requirements makes the equipment no longer compliant.

Appendix C: Troubleshooting

Port mapping fails when using DirectCommand

This section describes some considerations that may apply if port mapping fails when a user attempts DirectCommand access to an SP.

If DirectCommand is invoked by an unprivileged user (such as a regular user on a UNIX-based system), DirectCommand may not be able to open privileged TCP ports (numbered below 1024). DirectCommand attempts to open the port by adding an offset to any requested port number that is less than 1024 and by automatically modifying the URL to represent the new local port. However, if the service provided by an SP can operate only on the original predetermined TCP port, DirectCommand does not work properly and displays a descriptive warning. If this occurs, DirectCommand connections may be made to the SP only by workstation administrators.

Restarting the MergePoint SP5x00 manager

If necessary, you can use the following options to restart the MergePoint SP5x00 manager.

To restart the MergePoint SP5x00 manager through a serial connection:

1. Connect a terminal or a workstation that is running a terminal emulation program to the serial port.
2. Start a session with the port settings of serial speed as 9600 bps, data length as 8 data bits, parity as none, stop bits as 1, flow control as none and emulation as ANSI.

   Once a connection is established, a prompt appears.
3. To restart the appliance, type **5** (Reboot).

   -or-

   To reset the appliance network settings and remove licenses, type **5** (Reboot) and press **Ctrl + Z** when prompted to enter the next menu. All appliance settings will be erased. When you log in to the appliance again, the appliance configuration wizard opens. See *MergePoint SP Manager Configuration Wizard* on page 16.

   -or-

   To remove all SPs, type **8** (Restore to Factory Default). All SP IP addresses are erased, but the appliance network settings and licenses remain intact.

   -or-

   To reset the MergePoint SP manager to a previous firmware version, type **7** (Roll back the version). Type **0** (Logoff) to exit.

Restarting the MergePoint SP5x24/5x40 manager

If necessary, you can use the following commands to restart the MergePoint SP5x24/5x40 manager.

To restart the MergePoint SP5x24/5x40 manager:

1. Log into the console port as **root**
2. Type the password of the root user. The default password **Sydney**.
3. Type **reboot** to restart the appliance.

   -or-

   Type **restorefactory** to set the appliance with default configuration parameters and reboot the appliance.

Service processor troubleshooting

- If a service processor cannot be added, perform the following to confirm that it is supported by the MergePoint SP manager model and firmware version that you are using.
  - Check that the service processor card is setup correctly. Refer to the guidelines in the documentation included with the service processor.
  - Check that you can ping the service processor from an SSH session to the MergePoint SP manager.
  - Check the SP profile on the MergePoint SP manager web interface. Determine what the default connection protocol is and confirm that you can independently connect to the card using this protocol.
  - If the service processor profile displays SSH, then open a PuTTY session and connect using an SSH protocol to the IP address of the service processor.
- If you are having trouble accessing an SP through a MergePoint SP manager session, make sure the SP name or alias is comprised of valid characters: A-Z, a-z, 0-9, “.”, “-”, or “_”.

Setting up a private subnet and DHCP service in the 192.168.0.x range

Staring with firmware version 4.2.x, the MergePoint SP manager uses 192.168.0.10 and 192.168.0.20 as eth0 and eth1 preset addresses, respectively, which can limit the private subnet range when using the onboard DCHP service. For users configuring a typical private subnet using 10.10.x.y, these preset interface addresses should have no impact.

If you choose to configure a private subnet in the range of 192.168.0.x, set the appliance IP address to 192.168.0.129 with a subnet mask of 255.255.255.128. The preset IP address for eth0

and eth1 can remain as is. The DHCP range must be set up to use addresses between 192.168.0.130 and above.

Or, if you want to use the entire range of 192.168.0.x, complete the following steps.

- Ensure eth0 and eth1 have an address outside of the 192.168.0.x range (typically eth0 will have an address outside of this range). See *Private Subnets on the MergePoint SP5x24/SP5x40 Manager* on page 24. Or, to check the eth0 and eth1 addresses on the command line, use the **ifconfig eth0** and **ifconfigeth1** commands.
- Optional) As a best practice, set the appliance side IP address for the private subnet to 192.168.0.1. See *Private Subnets on the MergePoint SP5x24/SP5x40 Manager* on page 24.
- Set the subnet netmask to 255.255.255.0. See *Configuring MergePoint SP5x00 manager network settings* on page 21 or *Configuring MergePoint SP5x24/SP5x40 manager network settings* on page 22.

Appendix D: Access Privileges

This appendix shows the access privileges that are required when the listed actions are performed either by appliance users or SP users. To set privileges for a MergePoint SP manager user, see *Managing MergePoint SP Manager User Accounts* on page 29. To set privileges for a SP user, see *Managing user accounts on SPs* on page 45.

Appliance users actions

NOTE: Admin users can perform all actions on appliances and SPs.

The following appliance user actions can be performed by Operators:

- To power a target device up/down
- To set LED indicator on/off for a target device
- To set SP cold reset
- To execute a BMC self test
- To power a device group up/down
- To edit the SP user (including enable user, username, password and privilege)
- To set the event alert destination (PET) setting for an SP
- To set the event destination (PET) setting for a group
- To edit the SoL configuration
- To set the SP time for an SP
- To clear all SEL records
- To use the CLP commands (reset, set SP properties, start map, start systemX, stop map1, stop systemX and oemavocent_setdefault)

The following appliance user actions can be performed by all users:

- To view the alert actions list
- To query alerts
- To log in/out of the appliance
- To show the appliance version on the interface
- To show the Help document
- To view the summary of license information
- To view SP system name

- To view SP firmware information
- To view SP FRU information
- To view target device power status
- To view chassis status
- To view LAN configuration
- To view SP user information (except password)
- To view the event alert destination (PET) setting
- To view the SoL configuration
- To view the current SP time
- To view SEL records
- To view sensors information
- To view SoL summary
- To execute SoL
- To view SoL history
- To execute SoL relay
- To view SEL records
- To view sensors information
- To view SoL summary
- To set SP RDP for an SP
- To set VNC for an SP
- To use the CLP commands (cd, show, version, help, oemavocent_show and exit)

SP users

The following SP user actions can be performed by all Operators:

- To view/edit LAN configuration
- To view SP user information (except password)
- To edit the SP user (including enable user, username, password and privilege)
- To view the event alert destination (PET) setting
- To set the event alert destination (PET) setting for an SP

- To set the event destination (PET) setting for a group
- To use the CLP commands (set SP properties, start systemX and stop systemX)

The following SP user actions can be performed by all users:

- To view SP system name
- To change alias for an SP
- To copy/move an SP to a device group
- To remove an SP
- To view SP firmware information
- To view SP FRU information
- To view target device power status
- To power a target device up/down
- To view chassis status
- To set LED indicator on/off for a target device
- To set SP cold reset
- To execute a BMC self test
- To power a device group up/down
- To view the SoL configuration
- To view the current SP time
- To view SEL records
- To view sensors information
- To view SoL summary
- To execute SoL
- To view SoL history
- To execute SoL relay
- To view SEL records
- To view sensors information
- To view SoL summary
- To set SP RDP for an SP

- To set VNC for an SP
- To use the CLP command: cd, reset, set Map 1 properties, show, start map, stop map1, stop systemX, version, help, oemavocent_setdefault, oemavocent_show and exit

Appendix E: Configuring the BIOS Settings for SoL

SoL enables the console output of a managed system to be redirected over an IPMI session over IP. This allows remote users to have text-based access to the BIOS, utilities, operating systems such as Command Line interfaces and Linux console and management services such as Microsoft's serial-based EMS. At the same time, SoL provides access to IPMI platform management functions.

To set the BIOS:

1. Enter the BIOS setting.
2. Select the *Console Redirection* option.
3. Point to Console Redirection and press **Enter**.
4. Change the Redirection After Boot value from Disabled to Enabled.
5. Save the settings to BIOS.

To set the BIOS with Windows 2003:

If your operating system is Windows 2003 Enterprise, enter the following command in the command line:

```
bootcfg /ems ON /port com1 /baud 19200 /id 1
```

To set the BIOS with Redhat Enterprise Linux 3.0:

1. Modify the /etc/grub.conf

```
#serial -unit=0 -speed=19200
#terminal -timeout=10 serial console
default=10
timeout=10
#splashimage …
Title Red Hat Linux …
root (hd0,2)
kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6
console=tty1 console=ttyS0,19200
initrd-2.4.18-4smp.img
```

2. Modify the /etc/inittab by adding the following text to the end:

```
7:2345:respawn:/sbin/agetty -h ttyS0 19200 vt100
```

3. Modify the /etc/securetty by adding the following text:

```
ttyS1
```

Appendix F: Configuring a Virtual Serial Port

The MergePoint SP manager has the ability to access SPs with iLO through the Virtual Serial port. To use this feature, you must enable the Virtual Serial port on both the BIOS Serial Console and EMS Console. When the Virtual Serial port is enabled, it provides remote access through the iLO management controller to the BIOS Serial Console.

To configure BIOS Serial Console:

1. Enter ROM-Based Setup Utility by pressing **F9** during power up or system reset.
2. Select *BIOS Serial Console and EMS* on the main menu and press **Enter** to display the options.
3. Select *BIOS Serial Console Port*, then press **Enter** to display the options.
4. Select *Com1* or *Com2* as the BIOS Serial Console Port and press **Enter** to save the selection.

To configure EMS Console:

1. Enter ROM-Based Setup Utility by pressing **F9** during power up or system reset.
2. Select *BIOS Serial Console and EMS* on the main menu and press **Enter** to display the options.
3. Select *EMS Console*, then press **Enter** to display the options.
4. Select the same port that you selected for the BIOS Serial Console Port and press **Enter** to save the selection.

Appendix G: Profile Configuration

The MergePoint SP manager uses profiles for handling communications with SPs. Profiles are introduced in *Managing SP Profiles (Admin users only)* on page 41. Administrator-modifiable parameters that are defined for each profile are Family and Command Template, either or both of which can be modified to enable communications with SPs that do not work out of the box.

Families, Expect scripts and command templates

Each SP should belong to a family. Each SP family is defined by an Expect script in the /etc/libexec/mergepoint directory in the form: talk_<family_name>.exp. For example, the Expect script that defines the iLO family is talk_ilo.exp.

The Expect scripts use text-based interfaces that are in command templates to log into the SPs and perform supported management actions on behalf of authorized users. One Expect script and one command template are assigned to each SP.

Because the default Expect scripts and command templates do not always work for all types of SPs, or for all SPs of the same type, you need to create a custom family (Except script), or create / modify a command templates as desired.

For a new type of SP, you need to perform the following procedures:

- Create a custom family (Except script)
- Create a user profile
- Test the existing template with the selected family
- If the test fails, then create new or modify a command template

For an SP of an existing type, but using different commands, you need to perform the following procedures:

- Create a user profile
- Test the existing template with the selected family
- If the test fails, then create new or modify a command template

Creating custom families

To create a new device family, the administrator can create a customized Expect script by copying, renaming and modifying one of the default Expect scripts. The administrator should set the file permissions to allow reading and execution by all users and writing by members of the admin group. The format of a custom Expect script's file name should be: talk_ customN.exp.

NOTE: Administrators need to create new Expect scripts for new families by using talk_custom1.exp, talk_custom2.exp, or talk_custom3.exp for the filenames in the /etc/libexec/mergepoint directory.

To create a custom family (Expect script):

1. Log into the MergePoint SP manager console as **admin**.
2. Go to the /etc/libexec/mergepoint directory.
3. A user can create a new script talk_customN.exp or copy an existing talk_<family_name>.exp and name the new file in the format: talk_customN.exp.

NOTE: Use *talk_custom1.exp* for the first custom script, *talk_custom2.exp* for a second, up to a total of three scripts.

4. Edit the script as desired.
5. Save and quit the file.
6. Make sure the permissions are still 755.

NOTE: Contact your Avocent representative if you need additional support for creating a custom Expect script.

Default family names and corresponding Expect script names

Table G.3: Default Family Names and Corresponding Expect Script Names

Family Name	Expect Script Name
alom	talk_alom.exp
blade_center	talk_blade_center.exp
custom1	talk_custom1.exp
custom2	talk_custom2.exp
custom3	talk_custom3.exp
devconsole	talk_devconsole.exp
drac	talk_drac.exp
drac_mc	talk_drac_mc.exp
drac3	talk_drac3.exp
drac5	talk_drac5.exp

Family Name	Expect Script Name
elom	talk_elom.exp
hp_blade_system	talk_hp_blade_system.exp
hp_ipmi	talk_hp_ipmi.exp
idrac_m600	talk_idrac_m600.exp
idrac_m605	talk_idrac_m605.exp
idrac_m610	talk_idrac_m610.exp
idrac_m710	talk._idrac_m710.exp
idrac_m805	talk_idrac_m805.exp
ilo	talk_ilo.exp
ilo2	talk_ilo2.exp
ilom	talk_ilom.exp
m1000e_cmc	talk_m1000e_cmc.exp
rsa_II	talk_rsa_II.exp
rsa_II_withoutsol	talk_rsa_II_withoutsol.exp

NOTE: There are no corresponding Expect script files for families dell_10g, ipmi_1.5, ipmi_2.0, fsc_irmc and fsc_irmc_II.

Service processor/device Expect script arguments

With one exception, each of the Expect scripts used to control access to a service processor takes exactly five arguments in the following format:

```
talk_type.exp ip user passwd spprofilename action
```

The exception to the format above occurs when the action is spconsole. When the fifth argument is spconsole, any other number of arguments may follow; all arguments entered after the spconsole actions are collected into a single command to be executed in the SP's native command interface.

```
talk_type.exp ip user passwd spprofilename spconsole
[command1|...|commandN]
```

ip, user, passwd, spprofilename

These four arguments separately represent the IP address, username, password or profile name of the device on the MergePoint SP manager.

action

The action specifies the action for the script to take. The actions are listed below. Not all device types implement all of the listed actions. For example, the iLO type does not have a sensors reading feature, so the sensors action is not supported for iLO type servers. See *Service processor/device Expect script exit codes* on page 209 for the correct way to handle an unexpected action argument.

- Sensors: Asks the service processor for a sensor reading and displays service processor sensor output on standard output.
- poweron: Asks the service processor to turn on its server.
- poweroff: Asks the service processor to turn off its server.
- powercycle: Asks the service processor to reboot its server.
- powerstatus: Asks the service processor if its server is turned on.
- reset: Asks the service processor to reset its server.
- spconsole: The native command line of the service processor. Enters interactive passthrough mode. The script authenticates with the service processor, then connects the output directly to its standard output and its standard input to the input.

NOTE: SSH must be invoked with the -t option when this mode is used.

- devconsole: Enters a console (also known as device console) session on a server whose service processor supports console access to the server or enters a console session on a server or other device that supports device console access through its Ethernet port.

NOTE: SSH must be invoked with the-t option when this mode is used.

Service processor/device Expect script exit codes

Scripts that handle devices must end with one of the exit codes shown in .

Table G.4: Expect Script Exit Codes

Exit Code	Definition
0	Success

Exit Code	Definition
1	Unexpected output from service processor/device, or another error in an protocol (such as time-out)
3	Failed to connect with service processor
4	Host identification failed (only for connection through SSH)
5	User verification failed
6	Command template not found
7	Some necessary information not found in command template
10	Invalid argument
11	Action not supported

Creating a profile

Profiles are introduced in *Managing SP Profiles (Admin users only) on page 41*.

Configuring command templates

When adding a new SP that needs a template, the administrator must perform the following actions:

- Test whether the SP is compatible with the applicable default command template.
- If communications cannot be established with the new SP using a default command template, use the sptemplate utility to create and test a new command template after making any needed changes to the commands that manage communications between the SP and the MergePoint SP manager.
- If a new template cannot be made to work, create a custom Expect script to handle the SP's requirements.

When one of the command templates is modified by an administrator, it applies to all SPs that use the template. Create a new template using the web interface when you do not wish to overwrite one of the defaults.

To find out if an existing command template works with a new SP:

1. Assign the SP the appropriate profile and the associated default command template for the profile.
2. Try to run power management commands on the SP.

3. If you can run power commands on the SP, test the rest of the management commands that are supported on the device type. If they work, you are done.
4. If you cannot run one or more of the supported commands on the SP, attempt to connect to the console.

NOTE: Even if the power management commands do not work on a new SP, you can usually establish a connection to the service processor's console.

5. If you cannot access the console, perform the following steps:
   a. Use ping, Telnet or SSH to verify that you can get to the server.
   b. If you cannot access the server, check the network configuration and fix the problem that is preventing access.
6. If you can access the server but still cannot access the service processor's console, double-check the username and password you are using against the username and password that are configured for the SP.
7. Once you have established the connection to the service processor's console, type the help command, which gives you the syntax you need to use for the commands supported by the service processor.
8. Note the syntax of the commands supported by the service processor's console, and go to the next procedure.

To use the sptemplate utility to create a new template:

Perform this procedure after *Configuring command templates* on page 210 if the default templates do not work for a new SP.

NOTE: If you select *Profile* in the web interface and select the *Templates configuration* button, you are logged into the console and the sptemplate utility automatically launches. Go directly to step 2.

1. Log into the console as an administrator.
2. Select *New* from the menu.
3. Enter a name, such as rsa.new. The editor brings up a template for a new command template and assigns it the name you specified. See *Configuring command templates* on page 210 for details.
4. Modify the prompts and commands as needed, using the syntax supported on the SP. Sensors may not be supported. If any command is not supported, leave it commented out in the template.

NOTE: You must specify the escape sequence used by the device's console. It is captured by the MergePoint SP manager and it is used to log the user out of the SP console whenever the user logs out of the device console, preventing unauthorized access to the SP console.

5. Save and quit the file.
6. Enter the **saveconf** command.
7. Log out from the console.
8. Log in to the web interface as an administrative user and select *Target - Profile*.
9. In the User Profile area, click *Add*.
10. In the Command Template drop-down menu, the new template is automatically added and is included in the list of command templates that you can assign to a profile.
11. Assign the new template to the profile.

NOTE: The new template is automatically added to the Command Template drop-down menu the next time an administrative user logs into the web interface.

To use the sptemplate utility to test a template:

When sptemplate is used to test a template, extra debugging information is provided to report on commands sent to and received from the SP.

1. Log into the console as an administrator.
2. Select *Test* from the menu.
3. At the prompt, confirm that you want to continue by entering **y**. A list of templates appears.
4. Select a template to test. A list of configured SPs appears.
5. Select an SP to test the template against. The editor runs the commands in the specified template and returns debugging information that you can record for making command changes in a new template.
6. Choose a command to test.
7. At the prompt, enter the username and password you used when logging into the MergePoint SP manager.
8. Go to *To use the sptemplate utility to create a new template:* on page 211.

Default command templates

lists the default command templates and describes the types of SP profiles to which they apply.

Table G.5: Default Command Templates

Template	SP Profiles
alom.default	Sun ALOMs
blade_center.default	IBM BladeCenter
devconsole.default	SPs that support access to their consoles
drac_mc.default	Dell DRAC MC
drac3.default	DRAC III
drac.default	DRAC IV
drac5.default	DRAC V
elom.default	ELOM
hp_blade_system.default	HP BladeCenter
hp_ipmi.default	HP IPMI
idrac_m600.default	Dell iDRAC M600 blade
idrac_m605.default	Dell iDRAC M605 blade
idrac_m610.default	Dell iDRAC M610 blade
idrac_m710.default	idrac_m710.default
idrac_m805.default	Dell iDRAC M805 blade
ilo.default	iLO
ilo2.default	iLO2
ilom.default	ILOM
m1000e_cmc.default	Dell M1000e Chassis
None	IPMI 1.5 Any type of SP when only native IP access is being configured
rsa_withoutsol.default	RSA II SPs do not support SoL
rsa.default	Standard RSA II

NOTE: You cannot change templates whose name ends with the .default suffix. sptemplate warns about this restriction if you try to edit or rename these templates, and it requests confirmation before allowing you to create a new template with a .default suffix through the New, Rename or Copy functions.

Using the sptemplate utility

A template can be configured to keep repeating commands to achieve a goal such as reading output from multiple classes of sensors on an RSA II SP or reading multiple event log files one by one until no more log files exist on an iLOtype service processor. Commands may be repeated until a string, such as No more entries, is returned. When commands are repeated, an escape sequence can be used to automatically increment the number in the command, which is needed, for example, when checking event log files.

The default editor used by sptemplate is vi. You can substitute nano for vi before invoking the sptemplate utility, as shown in the following example:

```
admin@MergePoint:~# export EDITOR=/bin/nano
```

After being invoked, the sptemplate utility displays the action menu shown in the following example:

```
admin@MergePoint:~# mgp_template
Please select action:
-View
Edit
New
Copy
Rename
Delete
Test
Exit
```

Selecting *New* from the Action menu brings up an editor with a template file open for you to configure.

Selecting *View*, *Edit*, *Copy*, *Test* or *Rename* from the Action menu brings up a menu of templates like the one shown in the following example:

```
Please select template to view:
-blade_center.default
drac_mc.default
drac3.default
drac4.default
drac5.default
idrac_m600.default
idrac_m605.default
```

```
idrac_m610.default
idrac_m710.default
idrac_m805.default
ilom.default
hp_blade_system.default
hp_ipmi.default
m1000e_cmc.default
rsa.default
rsa_withoutsol.default
ilo.default
ilom.default
alom.default
devconsole.default
newtemplate_1
Exit
```

If *Test* is selected, after the administrator selects a template, a list of SPs that use the selected template appears, like the list shown in the following screen example:

```
Select Service Processor to test against:
-rack1_ibm_e360_rsa_II
rack2_ibm_e360_rsa_II
```

After the administrator selects a template and an SP to test, a list of commands to test displays like the one shown in the following example:

```
rack2_ibm_e360_rsa_II
-Access the service processor's console
Access the device's console via SoL
Manage power
Reset SP
Manage the event log - Not Supported
View sensor output
Start Telnet session
Start SSH session
Exit
Back
```

Not all listed commands are supported on every type of SP. If you select an unsupported command, an error message displays that lists the supported commands.

The first time you select any action to test, you are prompted to enter a username and password. If local authentication is specified for the SP, enter the username and password that you entered

to access the MergePoint SP manager. If another authentication method is specified for the SP, use the appropriate username and password for the specified authentication method. The test command uses the same authentication and authorization processes that the MergePoint SP manager uses in its normal operation.

See the following examples:

- The MergePoint SP manager uses local authentication, and the administrator logs into the MergePoint SP manager using the username and password pair: root/root_password.
- The administrator tests the rsa.default command template on a server called rack1_ibm_e306_rsa, which is configured for RADIUS authentication with username scottb and password cycl123. The administrator must enter scottb and cycl123 to perform the test.
- The administrator tests the rsa.default command template on a server called rack2_ibm_e306_rsa, which is configured for LDAP authentication with username sburns and password 123cycl. The administrator must enter sburns and 123cyclto perform the test.
- The administrator tests the rsa.default command template on a server called rack3_ibm_e306_rsa, which is configured for local authentication. The administrator must enter the same username/password pair that was entered to access the MergePoint SP manager (root/root_password.) to perform the test.

Each set of commands may be tested in any order after the login test is performed. Errors are generated if a command is entered out of logical order; for example, if the Reset command is issued for a server that is not powered on. After any test you can return to the editor to make changes.

While using the editor to edit, copy or create a new template, you can edit or delete fields and add comments. When the file is saved, error checking is performed. If an error is found, you are prompted either to enter the editor again to fix the error, or to discard the changes.

The following are examples of commands:

```
[rsa.default]
type = rsa_II
login_prompt = rname:
pass_prompt = sword:
cmd_prompt = [a-zA-Z0-9 #]+>
logout_cmd = exit
version_cmd = vpd ismp
poweron_cmd = power on
poweroff_cmd = power off
powercycle_cmd = power cycle
powerstatus_cmd = power state
```

```
reset_cmd = reset
sensors_cmd = {
command = fans
command = temps
command = volts
}
sel_cmd = {
command = readlog -f
repeat = readlog
until = [\n\r]*(There are no more entries in the event log.)
}
clearsel_cmd = clearlog
devconsole_cmd = console 2
devconsole_esc = \033.
ignore = {
ignore = (There are no more entries in the event log.)[\n\r]*
}
```

Appendix H: Glossary and Acronyms

Blade chassis or BladeCenter

A server architecture that houses multiple server modules (blades) in a single chassis. The self-standing or rack mounted blade chassis provides the power supply, and each blade has its own CPU, memory and hard drive. The chassis may have its own service processor, while each blade it contains may also have its own service processor.

Blade or blade card

A server module that is housed in a blade chassis.

BMC

The Baseboard Management Controller (BMC) is a specialized micro-controller on an IPMI SP that monitors and logs environmental conditions, such as temperature, voltage and power supply.

CIM

Common Information Model (CIM), developed by DMTF, is a common data model of a schema used to describe overall management information in a network or enterprise environment.

Client PC

The client PC is a remote user workstation that is currently running the MergePoint SP manager web interface through a browser.

DMTF

The Distributed Management Task Force (DMTF) is a not-for-profit association promoting enterprise and systems management and interoperability. Visit www.dmft.org for more information.

DRAC

The Dell Remote Access Card (DRAC) is an intelligent service processor integrated on certain Dell SPs. DRAC III and IV SPs are supported by the MergePoint SP manager.

iLO

Integrated Lights-Out (iLO) is an intelligent service processor integrated on certain Hewlett Packard (HP) SPs. iLO SPs are supported by the MergePoint SP manager.

IPMI

Intelligent Platform Management Interface (IPMI) defines a set of common interfaces to computer hardware and firmware. System administrators may use IPMI to monitor system health and manage a system with an IPMI BMC. Target devices with IPMI BMCs are supported by the MergePoint SP manager.

MOF

Managed Object Format (MOF) is a data structure used by CIM to describe all managed SPs on the network.

PET

Platform Event Trap (PET) is a specific format of SNMP trap used for system management alerts.

Service Processor (SP)

An SP is an interface card on a target device. SPs are available from multiple vendors including Dell, FTS, IBM, HP and Sun. Each SP has its own processor, memory, battery, network connection and access to the system bus. From the MergePoint SP manager, administrators can access and manage multi-vendor SPs through a single interface.

SMASH CLP

Systems Management Architecture for Server Hardware (SMASH) Command Line Protocol (CLP)
has been used to create commands that can be used to configure the MergePoint SP manager and

configure and access SP groups through Telnet or SSHv2 sessions.

SSH

Secure Shell (SSH) is a UNIX-based command interface and protocol that allows administrators to securely access a remote SP.

SoL

With Serial over LAN (SoL), the serial console output of a device is redirected over IP, providing access to text-based interfaces for BIOS, utilities, operating systems and applications and to service processor functions.

Target or target device

A target device can be a data center component such as a server or router that an administrator can remotely manage through the MergePoint SP manager.

Telnet session

A Telnet session is a type of SP session. Once the MergePoint SP manager is set up, a user may connect directly to an SP using Telnet and manage the SP using SMASH CLP commands.

Unit

Unit refers to the MergePoint SP manager. A device being managed by the appliance is referred to an SP or a target device.

WBEM

WBEM stands for Web Based Enterprise Management. WBEM is a set of management and Internet standard technologies developed by DMTF to unify the management of distributed computing environments.

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